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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 20 1994

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: **Product and Residue Chemistry Chapters for the Trifluralin Reregistration Eligibility Decision (RED) Document.**
CBRS No.: 13669
DP Barcode No.: D203167
Chemical No.: 036101
Reregistration Case No.: 0179

Bonnie Cropp-Kohlligian

FROM: Bonnie Cropp-Kohlligian, Environmental Scientist
Reregistration Section I
Chemistry Branch II: Reregistration Support
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THRU: Paula A. Deschamp, Section Head
Reregistration Section I
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TO: Esther Saito, Chief
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AND

Debra Edwards, Chief
Chemical Coordination Branch
Health Effects Division [7509C]

Attached are the Product and Residue Chemistry Chapters for the Trifluralin RED Document. These documents were compiled by Dynamac Corporation and have been revised by CBRS, HED to reflect branch policies.

PRODUCT CHEMISTRY

Generic and product-specific data remain outstanding for all of the trifluralin technical products. CBRS has no objection to the reregistration of trifluralin with respect to product chemistry data requirements, provided that the registrants submit the data for the trifluralin manufacturing-use products as specified in the attached Product Chemistry Chapter of the Trifluralin RED Document and either certifies that the suppliers of the starting materials and the manufacturing process have not changed since the last comprehensive product chemistry review or submits a complete updated product chemistry data package.

RESIDUE CHEMISTRY

Sufficient data are available to ascertain the adequacy of the established tolerances listed in 40 CFR §180.207 (as defined) for the following commodities: asparagus; barley forage; barley hay; barley straw; carrots; citrus fruits; corn grain (exc. popcorn); corn forage; corn fodder; cottonseed; cucurbits; flax seed; grapes; hops; nuts; peanut hulls; peanuts; peppermint, hay; rape seed; safflower seed; sorghum forage; sorghum fodder; spearmint, hay; stone fruits; sugarcane; sunflower seed; vegetables, fruiting; wheat, grain; and wheat, straw.

Available data for wheat straw and barley straw reflecting treatment at the maximum registered application rate indicate that the established tolerance for residues of trifluralin in/on wheat straw, barley straw, and barley hay should be increased to 0.1 ppm.

The established crop group tolerance for the obsolete "root vegetables (exc. carrots)" should be revoked concomitant with the establishment of: (i) a tolerance for root and tuber vegetables (exc. carrots) at 0.05 ppm; and (ii) a tolerance for bulb vegetables group at 0.05 ppm. The available data for radish roots and sugar beet roots will be translated to chicory roots and turnip roots.

The established crop group tolerance for the obsolete "leafy vegetables" should be revoked concomitant with the establishment of: (i) separate tolerances for celery and endive, each at 0.05 ppm; (ii) a tolerance for leaves of root and tuber vegetables group at 0.05 ppm; and (iii) a tolerance for Brassica (cole) leafy vegetables group at 0.05 ppm. The available data for celery will be translated to endive.

The established crop group tolerance for the obsolete "seed and pod vegetables" should be revoked concomitant with the establishment of: (i) a tolerance for legume vegetables (succulent/dried) group at 0.05 ppm; and (ii) a separate tolerance for okra at 0.05 ppm.

The established crop group tolerance of 0.05 ppm in/on "grain crops (except corn and rice grain)" is inappropriate because there are no registered uses for rice, a representative commodity of this group; furthermore, the use directions are not uniform for the representative commodities of this group. Therefore, the established crop group tolerance for "grain crops (except corn and

rice grain)", should be revoked concomitant with the establishment of individual tolerances, each at 0.05 ppm, for barley grain and sorghum grain. Separate adequate tolerances of 0.05 ppm already exist for corn and wheat grain. The available data for field corn grain will be translated to sorghum grain.

The established crop group tolerance for "forage legumes" should be revoked concomitant with the establishment of: (i) a tolerance for foliage of legume vegetables group at 0.05 ppm; and (ii) a separate tolerance for alfalfa forage at a level to be determined upon receipt of required magnitude of the residue data.

The established tolerance for mung bean sprouts should be revoked because no registered uses exist for mung bean sprouts *per se*.

The established tolerance for upland cress should be revoked because no registered uses exist.

The Agency no longer considers barley fodder and rape straw as raw agricultural commodities of barley and rape, respectively (TABLE II (June 1994)). The established tolerances for barley fodder and rape straw should be revoked.

Sufficient data are available to recommend for the establishment of a tolerance for residues of trifluralin at 0.05 ppm in/on the following raw agricultural commodities: almond hulls, barley grain, celery, okra, peanut hay, sorghum grain, and wheat forage.

Based on available celery data which have been translated to endive, a tolerance for the residues of trifluralin should be established in/on endive. A tolerance of 0.05 ppm would be appropriate.

Sufficient data on representative commodities are available to recommend for the establishment of the following crop group tolerances for residues of trifluralin at 0.05 ppm: Brassica (cole) leafy vegetables, bulb vegetables, foliage of legume vegetables, leaves of root and tuber vegetables, and legume vegetables (dry and succulent).

Sufficient mustard seed data are available to recommend for the establishment of a tolerance for residues of trifluralin at 0.01 ppm in/on mustard seed.

A tolerances for residues of trifluralin in/on wheat hay must be established. Based on available barley straw and wheat straw data, a tolerance of 0.1 ppm would be appropriate.

The registrant must also propose tolerances for alfalfa forage and sunflower forage once adequate data have been submitted and evaluated.

Additional magnitude of the residue data are required before the established tolerances for alfalfa hay and flax straw can be assessed.

The "(N)" designation should be deleted from all 40 CFR §180.207 entries.

The Agency currently recognizes cotton gin by products as a raw agricultural commodity of cotton and has determined that label restrictions for rape forage and safflower forage are not appropriate (TABLE II (June 1994)). Therefore, tolerances for cotton gin by products, rape forage and safflower forage must be established. The registrant must propose a tolerance for cotton gin byproducts once adequate data have been submitted and evaluated. The required data for sunflower forage will translated to rape forage and sunflower forage.

The Agency has recently updated the Livestock Feeds Table (Table II of the Pesticide Assessment Guidelines, Subdivision O, Residue Chemistry, issued June 1994). As a result of changes in the Livestock Feeds Table (TABLE II (June 1994)), magnitude of the residue data are hereby required for cotton gin byproducts. New data requirements should be imposed at the issuance of the Trifluralin RED but should not impinge on the reregistration eligibility decision for trifluralin. The need for additional tolerances for residues of trifluralin in/on cotton gin byproducts and revisions to exposure/risk assessments will be made upon receipt of the required residue chemistry data.

The tolerances listed in 40 CFR §185.5900 are for the residues of trifluralin *per se*. Additional processing data are required for peppermint and spearmint before the established tolerances for peppermint oil and spearmint oil can be reassessed. Delaney clause issues may affect the continuation of these tolerances.

Trifluralin was one of the pesticides that has established tolerances under section 409(f) of the FFDCA which was challenged in court because of Delaney issues, as indicated in a petition previously filed by NRDC. A final rule to revoke the food additive tolerances for residues of trifluralin in peppermint oil and spearmint oil [§185.5900] was issued with an effective date of 8/30/93. In response to the 8/13/93 objections and hearing and stay requests filed by NACA and other registrants to a final rule revoking certain food additive tolerances, the Agency has decided to stay the effective date indefinitely (59 FR 33684, 6/30/94).

DIETARY EXPOSURE ASSESSMENT

Plant metabolism data for trifluralin are adequate. Except for alfalfa forage, alfalfa hay, flax straw, and sunflower forage, the field trial data are adequate. The residue study on corn forage, fodder, and silage is adequate pending submission of acceptable data validating the analytical method (Method No. GRM92.11) at or below the established 0.05 ppm tolerance level. Peppermint and spearmint processing data remain outstanding. Information concerning sample storage intervals and conditions for numerous magnitude of the residue studies previously submitted and reviewed in the Trifluralin Registration Standard (7/12/85) remain outstanding. Acceptable storage stability studies have been conducted on numerous commodities matrices. The existing data indicate that the established tolerances and/or the revised tolerance recommendations made in this report are supported.

The qualitative nature of the residue in animals is adequately understood. Based on available

ruminant and poultry metabolism data, the Agency has concluded that there is no reasonable expectation of finite residues of trifluralin in animal commodities. Therefore, there is no need for tolerances for trifluralin residues in meat, milk, poultry and eggs.

The dietary exposure assessment for trifluralin will be based on tolerance level residues and proposed tolerance levels as indicated herein. Though confirmatory, receipt of the required sample storage information will increase our confidence with respect to risk assessment since the associated magnitude of the residue data comprise a substantial portion of the total magnitude of the residue data base available for risk assessment. Since tolerance level residues will be used, the risk assessment will likely be upper bound; the major uncertainty in the assessment is the lack of information on storage information on storage intervals and conditions which could lead to the need for higher tolerances for some crops if field trial samples were not appropriately handled.

Attachments: Product and Residue Chemistry Chapters for the Trifluralin Reregistration Eligibility Decision (RED) Document.

cc: BLCKohlligian (CBRS), Trifluralin SF, Trifluralin Reg. Std. File, Trifluralin Update File, RF, Circulate, DRES (E. Doyle), Dynamac.

RDI: PDeschamp:10/13/94 MMetzger:10/17/94 EZager:10/17/94

7509C:CBRS:BLCKohlligian:CM#2:Rm 805B:703-305-7462:9/22/94.

DYNAMAC
CORPORATION
Environmental Services

Final Report

TRIFLURALIN
Shaughnessy No. 036101
Case No. 0179
(CBRS No. 13669, DP Barcode D203167)

Task 2A: Reregistration Eligibility Decision: Product Chemistry Considerations

August 10, 1994

Contract No. 68-D4-0010

Submitted to:
U.S. Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
The Dynamac Building
2275 Research Boulevard
Rockville, MD 20850-3268

TRIFLURALIN

REREGISTRATION ELIGIBILITY DECISION:

PRODUCT CHEMISTRY CONSIDERATIONS

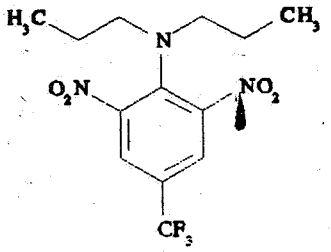
(Shaughnessy No. 036101; Case No. 0179)

CBRS No. 13669; DP Barcode D203167

TASK 2A

DESCRIPTION OF CHEMICAL

Trifluralin (α,α,α-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine) is a selective preemergence herbicide registered for weed control primarily on soybeans and cotton, as well as on various vegetable crops.



Empirical Formula:	$C_{13}H_{16}F_3N_3O_4$
Molecular Weight:	335.3
CAS Registry No.:	1582-09-8
Shaughnessy No.:	036101

IDENTIFICATION OF ACTIVE INGREDIENT

Trifluralin is a yellow-orange crystalline solid with a melting point of 42-49 C. Trifluralin is practically insoluble in water (< 1 ppm), but is readily soluble in organic solvents such as acetone, xylene, or aromatic naphthas.

MANUFACTURING-USE PRODUCTS

A search of the Reference Files System (REFS) conducted 6/9/94 identified the manufacturing-use products (MPs) listed below as registered under Shaughnessy No. 036101. At the time of the Trifluralin Reregistration Standard (7/85), the DowElanco products listed

below were registered to Elanco Products Company. When Elanco merged with Dow Chemical to become DowElanco, EPA registry numbers for the products were changed. Only the MPs listed below are subject to a reregistration eligibility.decision.

Formulation	EPA Reg. No. (date of Registration)	Registrant
98% T	11603-13 (2/73)	Agan Chemical Manufacturers, Ltd.
96% T	19713-226 (10/85)	Drexel Chemical Company
96% T	33660-3 (5/76)	Industria Prodotti Chimici S.P.A (I.Pi.Ci.)
95% T	62719-99 (12/89) [a]	DowElanco
50.8% FI	62719-172 (6/90) [b]	
44.5% FI	62719-101 (12/89) [c]	
20.0% FI	62719-133 (12/89) [d]	

[a] Previously registered to Elanco Products Company, EPA Reg No. 1471-70 (4/70).
[b] Previously registered to Elanco Products Company, EPA Reg No. 1471-120 (12/81).
[c] Previously registered to Elanco Products Company, EPA Reg No. 1471-72 (4/70).
[d] Previously registered to Elanco Products Company, EPA Reg No. 1471-145 (9/84).

REGULATORY BACKGROUND

The regulatory background for trifluralin products in terms of comprehensive product chemistry reviews is presented below.

Products (EPA Reg. No.)	April 1987 Guidance Document		October 1991 Update [a]	
	Data required	Data submitted in response	Data required	Data submitted in response
98% T (11603-13)	61-1, -2, -3 62-1, -2, -3 63-2 through -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3 63-2 through -5, -7 through -9, -11 through -13	61-3, 62-1, -2, -3 63-10, -13, -14, -16, -17, -20	61-3 62-1, -3 63-10, -13, -14, -16, -20
96% T (19713-226)	61-1, -2, -3 62-1, -2, -3 63-2 through -14, -16, -17, -20	none [b]	61-1, -2, -3 62-1, -2, -3 63-2 through -5, -7 through -14, -16, -17, -20	none [b]

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Products (EPA Reg. No.)	April 1987 Guidance Document		October 1991 Update [a]	
	Data required	Data submitted in response	Data required	Data submitted in response
96% T (33660-3)	61-1, -2, -3 62-1, -2, -3 63-2 through -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3 63-2 through -5, -7 through -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3 63-17, -20	[61-1, -2, -3 62-1, -2, -3] [c]
95% T (62719-99)	61-1, -2, -3 62-1, -2, -3 63-2 through -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3 63-2 through -5, -7 through -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3 63-8	61-1 62-1, -2, -3
50.8% FI (62719-172)	61-1, -2, -3 62-1, -2, -3 63-2 through -14, -16, -17, -20	61-1, -2 62-2, -3 63-2, -3, -4, -7, -12, -14 through -18, -20	61-1, -2, -3 62-1, -2, -3 63-17	61-1, -2, -3 62-2, -3 63-17
44.5% FI (62719-101)	61-1, -2, -3 62-1, -2, -3 63-2 through -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3 63-2, -3, -4, -7, -12, -14 through -18, -20	61-1, -2, -3 62-1, -2, -3	none
20.0% FI (62719-133)	61-1, -2, -3 62-1, -2, -3 63-2 through -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3 63-2, -3, -4, -7, -12, -14, -16, -17, -20	61-1, -2, -3 62-1, -2, -3	none

[a] Underlined data requirements for FIs will be satisfied by data for the technical source product (TGAI).

[b] Drexel has claimed a formulator's exemption because the 96% T is repackaged from an EPA registered product.

[c] These data have been reviewed by the Agency (CBRS No. 14012, D205239, 10/12/94, B. Cropp-Kohlligian).

Special Review was initiated (8/30/79) because trifluralin was determined to contain the contaminant N-nitroso-di-n-propylamine (NDPA) at levels which met or exceeded the oncogenic risk criterion. In a Position Document (PD 1/2/3), the Agency proposed to cancel all trifluralin product registrations unless registrants modified their labels to reflect < 1 ppm NDPA. Under this requirement, which was intended to pertain to both labels and CSFs, registrants were to certify an upper limit for NDPA of 1 ppm. In addition, registrants were

required to advise the Agency of quality control procedures instituted to reduce nitrosamine contamination, and to maintain adequate QC records. In the meantime, the Agency conducted a risk/benefit analysis concerning the use of products containing Trifluralin.

In 1982, the Agency revised its position on nitrosamine requirements for trifluralin and issued the Trifluralin PD-4 (7/82). On the basis of risk and exposure analyses, the allowable level of nitrosamines was reduced from 1 ppm to 0.5 ppm. The requirement for label amendment was dropped in response to comments from the trifluralin manufacturers. Under the PD-4 the registrants are required to list a 0.5-ppm upper certified limit for nitrosamines on CSFs for technical products. To allow for some nitrosamine generation in formulated products, the upper limit for total N-nitrosamine content is to be calculated on a percentage basis including a multiplication factor of 2 (e.g., for a 25% FI: 0.5 ppm nitrosamine in TGAI x 0.25% ai x 2 = 0.25 ppm maximum nitrosamine). The registrants are required to advise the Agency of quality control procedures and maintain QC records as specified in the PD 1/2/3. Although data remain outstanding concerning nitrosamine analysis for the trifluralin technical products, manufacturing processes have been modified to reduce the nitrosamine levels to below the 0.5-ppm maximum.

Because nitrosamine analysis and certified limits are required for all trifluralin technical and end-use products, analysis and certifications of nitrosamines in the DowElanco FIs will not be required. Preliminary analysis data requirements (including those for nitrosamine analysis) for the FIs will be satisfied by data for the technical source product (TGAI). The issue of nitrosamine levels in the trifluralin end-use products will not be considered under the RED but will be addressed in the DCIs for end-use products issued upon completion of the RED.

The current status of the product chemistry data requirements for trifluralin products is presented in the attached data summary tables. Please refer to these tables for a listing of the outstanding product chemistry data requirements.

We note that the Data Summary Table for the Drexel 96% T reflects data requirements assuming continued registration of the product; currently, the registration status of the Drexel technical is uncertain. In November of 1983, Eli Lilly and Company filed suit against Drexel and EPA, claiming that the registrations of Drexel's trifluralin technicals (EPA Reg. Nos. 19713-109 and 19713-226) were in violation of FIFRA. The first Drexel technical (EPA Reg No. 19713-109) was canceled on 8/12/85. The United States District Court, Southern District of Indiana, Indianapolis Division found that registration of the second Drexel technical (EPA Reg. No. 19713-226) was not in accordance with law. Results of this legal judgement have yet to be decided.

CONCLUSIONS

Generic and product-specific data remain outstanding for all of the trifluralin technical products. Provided that the registrants submit the data required in the attached data summary tables for the trifluralin manufacturing-use products, and either certify that the suppliers of beginning materials and the manufacturing processes for the trifluralin technicals and MPs have not changed since the last comprehensive product chemistry review or submit complete updated product chemistry data packages, CBRS has no objections to the reregistration of trifluralin with respect to product chemistry data requirements.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

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Subject:	EPA ID #20; Reg. # 62719-99 (Proposed) [Formerly EPA Reg. #1471-70]. DowElanco Trifluralin Technical (for Manufacturing Use). Letter of 12/21/89: Request for Nitrosamine Monitoring Waiver for EPs.
From:	K. Dockter
To:	J. Miller
Dated:	3/5/90
MRID(s):	None

CBRS No(s).:	7175, 7176, and 7177
Subject:	Response to the Trifluralin Reregistration Standard: Product Chemistry Data.
From:	R. Perfetti
To:	R. Engler and L. Rossi
Dated:	3/5/91
MRID(s):	40446902, 40453302, 40453303, 40453402, 40453403, 40453404, 40454701

CBRS No(s).:	13148 and 13194
DP Barcode(s):	D198774 and D198780
Subject:	Trifluralin Reregistration. Product Chemistry Data.
From:	B. Cropp-Kohlligian
To:	L. Rossi/W. Waldrop
Dated:	4/14/94
MRID(s):	43032201 and 42922501-42922506

CBRS No(s).:	14012
DP Barcode(s):	D205239
Subject:	Supplemental Product Chemistry Data for the I.Pi.Ci. Trifluralin 96% T (EPA Reg. No. 33660-3).

From: B. Cropp-Kohlligian
To: W. Waldrop/C. Childress
Dated: 10/12/94
MRID(s): 43233001

CBRS No(s).: 13499
DP Barcode(s): D201567
Dated: Review in progress
MRID(s): 43079901

CBRS No(s).: 13656, 13657, and 13658
DP Barcode(s): D202759, D202752, and D202718
Dated: Review in progress
MRID(s): 43143001, 43143002, 43186901, 43194101

PRODUCT CHEMISTRY CITATIONS

Bibliographic citations include only MRIDs containing data which fulfill data requirements.

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43079901 Tal, Y. (1993) Preliminary Analysis, Certification of Limits and Analytical Methods to Verify Certified Limits of Six Lots of TRIFLUREX Technical: Lab Project Number: 93-08. Unpublished study prepared by Agan Chemical Manufacturers, Ltd. 165 p.

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43143002 Stolz, W. (1994) Series 63: Physical and Chemical Characteristics of the Manufacturing Use and End Use Product: Treflan: Lab Project Number: GH/C/3229. Unpublished study prepared by Formulation Science and Technology Lab., DowElanco. 16 p.

43186901 Kinnunen, C. (1994) Series 62: Analysis and Certification of Product Ingredients of Trifluralin Technical Grade of Active Ingredient (TGAI): Lab Project Number: GH-C 3240: FOR93136.01. Unpublished study prepared by DowElanco. 233 p.

43194101 Kinnunen, C. (1994) Series 62: Analysis and Certification of Product Ingredients of Treflan 5: Lab Project Number: GH-C 3243. Unpublished study prepared by DowElanco Formulation Science and Technology Lab. 21 p.

43233001 I.Pi.Ci. Industria Prodotti Chimici SpA (1994) Trifluralin Technical--Product Chemistry Data: Supplement: Lab Project Number: 976. Unpublished study prepared by I.Pi.Ci. Analytical Laboratory. 134 p.

Case No. 0179
Chemical No. 036101

Case Name: Trifluralin
Registrant: Agan Chemical Manufacturers, Ltd.
Product(s): 98% T (EPA Reg. No. 11603-13)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	N [c]	40454701
61-2	Starting Materials and Manufacturing Process	Y [d]	40454701
61-3	Discussion of Formation of Impurities	N [e]	40454701 43032201
62-1	Preliminary Analysis	N [f]	40454701 *43079901*
62-2	Certification of Ingredient Limits	N [e]	40454701
62-3	Analytical Methods to Verify the Certified Limits	N [g]	40454701 **40692701** 42922501
63-2	Color	Y	40454701
63-3	Physical State	Y	40454701
63-4	Odor	Y	40454701
63-5	Melting Point	Y	40454701
63-6	Boiling Point	N/A [h]	
63-7	Density, Bulk Density or Specific Gravity	Y	40454701
63-8	Solubility	Y	40454701
63-9	Vapor Pressure	Y	40454701
63-10	Dissociation Constant	Y	42922502
63-11	Octanol/Water Partition Coefficient	Y	40454701
63-12	pH	Y	40454701
63-13	Stability.	Y	40454701 42922503
63-14	Oxidizing of Reducing Action	Y	42922504
63-15	Flammability	N/A [h]	
63-16	Explodability	Y	42922505
63-17	Storage Stability	N	
63-18	Viscosity	N/A [h]	
63-19	Miscibility	N/A [h]	
63-20	Corrosion Characteristics	Y	42922506

[a] Y = Yes; N = No; N/A = Not Applicable. Data requirements listed for Guideline Numbers 61-1 through 62-3 reflect the conclusions of CBRS No. 13499, D201567 (currently under review).

[b] Non-bolded citations were reviewed under CBRS Nos. 7175, 7176, and 7177, dated 3/5/91, by R. Perfetti; the **bolded** citation was reviewed in the Trifluralin Reregistration Standard Update dated 10/29/91; underlined citations were reviewed under CBRS Nos. 13148 and

13194, D198774 and D198780, dated 4/14/94, by B. Cropp-Kohlligian; and the *italicized* citation was reviewed under CBRS No. 13499, D201567 (currently under review).

[c] These data do not fully satisfy the requirements of 40 CFR §158.155 and §158.175 (Guideline Reference Nos. 61-1 and 62-2) concerning product identity and certified limits because a new CSF must be submitted which includes nominal concentrations and upper certified limits for three new impurities detected at levels $\geq 0.1\%$ in the current preliminary analysis, and appropriate revisions for impurities which had been reported previously at different levels. In addition, the label claim of 98% must be revised to reflect the nominal concentration (96.6%) of the active ingredient in the product.

[d] These data satisfy the requirements of 40 CFR §158.160-162 (Guideline Reference No. 61-2) concerning starting materials and the manufacturing process; however, Agan must confirm that the new impurities which were determined and the changes in levels of existing impurities are not the result of a change in the manufacturing process. If the manufacturing process has changed, a complete description of the new process, and information concerning the starting materials and quality control procedures will be required.

[e] These data do not fully satisfy the requirements of 40 CFR §158.167 (Guideline Reference No. 61-3) concerning discussion of formation of impurities because discussion concerning the formation of three new impurities which were detected in the current preliminary analysis is required.

[f] These data do not fully satisfy the requirements of 40 CFR §158.170 (Guideline Reference No. 62-1) concerning preliminary analysis because nitrosamines must be identified and quantified in six samples of the 98% T; two samples each to be analyzed shortly after production and at 3 and 6 months after production using a method sensitive to 1 ppm.

[g] These data do not fully satisfy the requirements of 40 CFR §158.180 (Guideline Reference No. 62-3) concerning enforcement analytical methods because Agan must demonstrate that the enforcement analytical method for impurities addressed in the Update is capable of determining the three new impurities detected in the current preliminary analysis; supporting validation data are required. Partial validation data (i.e., precision coefficients determined from replicate injections) are still required for three existing impurities which were also detected in the current preliminary analysis. Alternatively, Agan may propose the analytical method used in preliminary analysis as an enforcement method. In this case, data in support of the stated precision for each impurity would be required.

[h] Data are not required because the TGAI/MP is a solid at room temperature.

Case No. 0179
Chemical No. 036101

Case Name: Trifluralin
Registrant: Drexel Chemical Company
Product(s): 96% T (EPA Reg. No. 19713-226)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number
61-1	Product Identity and Disclosure of Ingredients	N [b]	
61-2	Starting Materials and Manufacturing Process	N/A [c]	
61-3	Discussion of Formation of Impurities	N/A [c]	
62-1	Preliminary Analysis	N/A [c]	
62-2	Certification of Ingredient Limits	N [b]	
62-3	Analytical Methods to Verify the Certified Limits	N/A [c]	
63-2	Color	N/A [c]	
63-3	Physical State	N/A [c]	
63-4	Odor	N/A [c]	
63-5	Melting Point	N/A [c]	
63-6	Boiling Point	N/A [c]	
63-7	Density, Bulk Density or Specific Gravity	N/A [c]	
63-8	Solubility	N/A [c]	
63-9	Vapor Pressure	N/A [c]	
63-10	Dissociation Constant	N/A [c]	
63-11	Octanol/Water Partition Coefficient	N/A [c]	
63-12	pH	N/A [c]	
63-13	Stability	N/A [c]	
63-14	Oxidizing of Reducing Action	N/A [c]	
63-15	Flammability	N/A [c]	
63-16	Explodability	N/A [c]	
63-17	Storage Stability	N/A [c]	
63-18	Viscosity	N/A [c]	
63-19	Miscibility	N/A [c]	
63-20	Corrosion Characteristics	N/A [c]	

[a] Y = Yes; N = No; N/A = Not Applicable. The Data Summary Table reflects data requirements assuming continued registration; currently the registration status of this product is uncertain. Following a 1983 law suit, (Eli Lilly and Company versus EPA and Drexel), the United States District Court, Southern District of Indiana, Indianapolis Division found that registration of the Drexel technical (EPA Reg. No. 19713-226) was not in accordance with law. Results of this legal judgement have yet to be decided.

[b] A CSF must be submitted on EPA Form 8570-4 (Rev. 12/90) which clearly states that this product is [redacted] and which includes nominal concentration and certified limits for the active ingredient.

[c] Because the [redacted], data requirements will be satisfied by the technical source product.

MANUFACTURING PROCESS INFORMATION IS NOT INCLUDED

Case No. 0179
Chemical No. 036101

Case Name: Trifluralin
Registrant: Industria Prodotti Chimici S.P.A (I.Pi.Ci.)
Product(s): 96% T (EPA Reg. No. 33660-3)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	N [c]	**40743901** (43233001)
61-2	Starting Materials and Manufacturing Process	N [d]	**40743901** (43233001)
61-3	Discussion of Formation of Impurities	Y	**40743901** (43233001)
62-1	Preliminary Analysis	Y	**40743902** (43233001)
62-2	Certification of Ingredient Limits	N [e]	**40743902** (43233001)
62-3	Analytical Methods to Verify the Certified Limits	N [e]	**40743902** (43233001)
63-2	Color	Y	40446902
63-3	Physical State	Y	40446902
63-4	Odor	Y	40446902
63-5	Melting Point	Y	40446902
63-6	Boiling Point	N/A [f]	
63-7	Density, Bulk Density or Specific Gravity	Y	40446902
63-8	Solubility	Y	40446902
63-9	Vapor Pressure	Y	40446902
63-10	Dissociation Constant	Y	40446902
63-11	Octanol/Water Partition Coefficient	Y	40446902
63-12	pH	Y	40446902
63-13	Stability	Y	40446902
63-14	Oxidizing of Reducing Action	Y	40446902
63-15	Flammability	N/A [f]	
63-16	Explodability	Y	40446902
63-17	Storage Stability	N [g]	40446902
63-18	Viscosity	N/A [f]	
63-19	Miscibility	N/A [f]	
63-20	Corrosion Characteristics	N [h]	40446902

[a] Y = Yes; N = No; N/A = Not Applicable.

[b] Non-bolded citations were reviewed under CBRS Nos. 7175, 7176, and 7177, dated 3/5/91, by R. Perfetti; **bolded** citations were reviewed in the Trifluralin Reregistration Standard Update dated 10/29/91; and citations in parentheses reviewed by the Agency in separate memo subsequent to the Update (CBRS No. 14012, D205239, 10/12/94, B. Cropp-Kohlligian).

[c] These data do not fully satisfy the requirements of 40 CFR §158.155 (Guideline Reference No. 61-1) concerning product identity because an impurity detected at greater than 0.1% in the preliminary analysis study must be included on the CSF. A nominal concentration and upper certified limit must be proposed for this impurity. In addition, the nominal concentration and upper certified limit proposed for another impurity have been increased (approximately 10 fold) and are no longer representative of the preliminary analysis. The nominal concentration and upper certified limit should be modified or an explanation of how these values were determined must be submitted.

[d] These data do not fully satisfy the requirements of 40 CFR §158.160-162 (Guideline Reference No 61-2) concerning starting materials and the manufacturing process because the source for an intermediate which may be purchased commercially rather than manufactured by I.Pi.Ci. must be provided.

[e] These data do not fully satisfy the requirements of 40 CFR §158.180 (Guideline Reference No. 62-3) concerning enforcement analytical methods because additional validation data are required for the methods used to determine the active ingredient and impurities.

[f] Data are not required because the TGAI/MP is a solid at room temperature.

[g] This study is under development.

[h] Data are required reflecting the corrosive effects of the product at full strength on materials used for packaging and storing.

Case No. 0179
Chemical No. 036101

Case Name: Trifluralin
Registrant: DowElanco
Product(s): 95% T (EPA Reg. No. 62719-99)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	Y [c]	**40453301 41241301** 43186901
61-2	Starting Materials and Manufacturing Process	N [d]	40453302
61-3	Discussion of Formation of Impurities	N [e]	40453302
62-1	Preliminary Analysis	N [f]	**40674702 40674703** 43186901
62-2	Certification of Ingredient Limits	N [g]	**40453301 41241301** 43186901
62-3	Analytical Methods to Verify the Certified Limits	N [h]	**40674704** 43186901
63-2	Color	Y	40453303 **40453401**
63-3	Physical State	Y	40453303 **40453401**
63-4	Odor	Y	40453303 **40453401**
63-5	Melting Point	Y	**40453401**
63-6	Boiling Point	N/A [i]	
63-7	Density, Bulk Density or Specific Gravity	Y	40453303 **40453401** 40453402
63-8	Solubility	N [j]	**40453401** 40453403
63-9	Vapor Pressure	Y	**40453401** 40453404
63-10	Dissociation Constant	Y	**40453401**
63-11	Octanol/Water Partition Coefficient	Y	**40453401**
63-12	pH	Y	40453303 **40453401**
63-13	Stability	Y	**40453401**
63-14	Oxidizing of Reducing Action	Y	40453303 **40453401**
63-15	Flammability	N/A [i]	
63-16	Explodability	Y	40453303 **40453401**
63-17	Storage Stability	Y	**41792901**
63-18	Viscosity	N/A [i]	
63-19	Miscibility	N/A [i]	
63-20	Corrosion Characteristics	Y	**41792901**

[a] Y = Yes; N = No; N/A = Not Applicable.

[b] Non-bolded citations were reviewed under CBRS Nos. 7175, 7176, and 7177, dated 3/5/91, by R. Perfetti; **bolded** citations were reviewed in the Trifluralin Reregistration Standard Update dated 10/29/91; and <u>underlined</u> citations were reviewed under CBRS Nos. 13656, 13657, and 13658, D202759, D202752, and D202718 (currently under review).

[c] These data satisfy the requirements of 40 CFR §158.155 (Guideline Reference No. 61-1) concerning product identity; however, when issues pertaining to nitrosamine analysis have been resolved, the registrant may need to revise the CSF. In addition, the registrant should take the necessary steps to have the label claim for this product changed from 95% to 96.3%.

[d] These data do not fully satisfy the requirements of 40 CFR §158.160-162 (Guideline Reference No. 61-2) concerning starting materials and the manufacturing process because the registrant must discuss the most recent technical trifluralin manufacturing process with respect to a change instituted to reduce nitrosamine content (CBRS No. 6186, 3/5/90, K. Dockter). A revised list of starting materials and a description of the production process must be submitted.

[e] These data do not fully satisfy the requirements of 40 CFR §158.167 (Guideline Reference No. 61-3) concerning discussion of formation of impurities because a revised discussion of impurity formation based on the most recent manufacturing process must be provided.

[f] These data do not fully satisfy the requirements of 40 CFR §158.170 (Guideline Reference No. 62-1) concerning preliminary analysis because issues pertaining to analysis for nitrosamines remain outstanding (currently under review at the Agency; CBRS No. 12457, D194687).

[g] These data do not fully satisfy the requirements of 40 CFR §158.175 (Guideline Reference No. 62-2) concerning certified limits because the proposed upper certified limits for most of the impurities do not appear to reflect the results of preliminary analysis, the registrant must provide additional information/explanation concerning the establishment of certified limits.

[h] These data do not fully satisfy the requirements of 40 CFR §158.180 (Guideline Reference No. 62-3) concerning enforcement analytical methods because additional validation data remain outstanding for the enforcement method used for the determination of nitrosamines in the 95% T.

[i] Data are not required because the TGAI/MP is a solid at room temperature.

[j] These data do not fully satisfy the requirements of 40 CFR §158.190 (Guideline Reference No. 63-8) concerning solubility because the registrant must provide quantitative data reflecting the solubility of trifluralin technical in acetone, acetonitrile, chloroform, dichloromethane, ethyl acetate, toluene, and hexane; summarizing the solubility of trifluralin in these solvents as >100 mg/mL is not acceptable.

Case No. 0179
Chemical No. 036101

Case Name: Trifluralin
Registrant: DowElanco
Product(s): 50.8% FI (EPA Reg. No. 62719-172)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	N [c]	**41251801** 43143001
61-2	Starting Materials and Manufacturing Process	N [d]	**41251801** 43143001
61-3	Discussion of Formation of Impurities	Y	43143001
62-1	Preliminary Analysis	N/A [e]	
62-2	Certification of Ingredient Limits	N [c]	**41251801** 43143001
62-3	Analytical Methods to Verify the Certified Limits	Y	**40674602** 43194101
63-2	Color	Y	**40453502**
63-3	Physical State	Y	**40453502**
63-4	Odor	Y	**40453502**
63-5	Melting Point	N/A [e]	
63-6	Boiling Point	N/A [e]	
63-7	Density, Bulk Density or Specific Gravity	Y	**40453502**
63-8	Solubility	N/A [e]	
63-9	Vapor Pressure	N/A [e]	
63-10	Dissociation Constant	N/A [e]	
63-11	Octanol/Water Partition Coefficient	N/A [e]	
63-12	pH	Y	**40453502**
63-13	Stability	N/A [e]	
63-14	Oxidizing of Reducing Action	Y	**40453502**
63-15	Flammability	Y	**40453502**
63-16	Explodability	Y	**40453502**
63-17	Storage Stability	N [f]	**40453502** 43143002
63-18	Viscosity	Y	**40453502**
63-19	Miscibility	N/A [g]	
63-20	Corrosion Characteristics	Y	**40453502**

[a] Y = Yes; N = No; N/A = Not Applicable.

[b] **Bolded** citations were reviewed in the Trifluralin Reregistration Standard Update dated 10/29/91; and non-bolded citations were reviewed under CBRS Nos. 13656, 13657, and 13658, D202759, D202752, and D202718 (currently under review).

[c] These data do not fully satisfy the requirements of 40 CFR §158.155 and §158.175 (Guideline Reference Nos. 61-1 and 62-2) concerning product identity and certified limits because the registrant must submit individual CSFs on EPA Form 8570-4 (Rev. 12/90) reflecting the basic and alternate formulations as represented by the two technical source products.

[d] These data do not fully satisfy the requirements of 40 CFR §158.160-165 (Guideline Reference No. 61-2) concerning starting materials and the manufacturing process because the following must be submitted: (i) the relative amounts of the starting material used in the two processes; (ii) a description of the equipment used that may influence product composition; and (iii) a description of the conditions (e.g., temperature, pressure, pH, humidity) that are controlled during each step of the process. In addition, the registrant must indicate whether or not these processes are used interchangeably with the two technical sources.

[e] This data requirement will be fulfilled by data for the technical source products.

[f] These data do not fully satisfy the requirements of 40 CFR §158.190 (Guideline Reference No. 63-17) concerning storage stability because the analytical method used, the storage temperature, and the storage container must be specified.

[g] This data requirement is not applicable because the product is not diluted in petroleum solvents.

Case No. 0179
Chemical No. 036101

Case Name: Trifluralin
Registrant: DowElanco
Product(s): 44.5% FI (EPA Reg. No. 62719-101)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	Y [c]	40452701
61-2	Starting Materials and Manufacturing Process	N [d]	40452701
61-3	Discussion of Formation of Impurities	Y [c]	40452701
62-1	Preliminary Analysis	N/A [e]	
62-2	Certification of Ingredient Limits	Y [c]	40674201
62-3	Analytical Methods to Verify the Certified Limits	Y [c]	40674102
63-2	Color	Y	40452702
63-3	Physical State	Y	40452702
63-4	Odor	Y	40452702
63-5	Melting Point	N/A [e]	
63-6	Boiling Point	N/A [e]	
63-7	Density, Bulk Density or Specific Gravity	Y	40452702
63-8	Solubility	N/A [e]	
63-9	Vapor Pressure	N/A [e]	
63-10	Dissociation Constant	N/A [e]	
63-11	Octanol/Water Partition Coefficient	N/A [e]	
63-12	pH	Y	40452702
63-13	Stability	N/A [e]	
63-14	Oxidizing of Reducing Action	Y	40452702
63-15	Flammability	Y	40452702
63-16	Explodability	Y	40452702
63-17	Storage Stability	Y	40452702
63-18	Viscosity	Y	40452702
63-19	Miscibility	N/A [f]	
63-20	Corrosion Characteristics	Y	40452702

[a] Y = Yes; N = No; N/A = Not Applicable.

[b] All citations were reviewed in the Trifluralin Reregistration Standard Update dated 10/29/91.

[c] The Update required additional data concerning the impurities of the TGAI; however, this requirement will be satisfied by data for the technical source product.

[d] These data do not fully satisfy the requirements of 40 CFR §158.160-165 (Guideline Reference No. 61-2) concerning starting materials and the manufacturing process because technical specifications of the inerts and solvents, duration of the manufacturing process, and a detailed description of the equipment and packaging materials used must be provided.

[e] This data requirement will be fulfilled by data for the technical source product.

[f] This data requirement is not applicable because the product is not diluted in petroleum solvents.

Case No. 0179
Chemical No. 036101

Case Name: Trifluralin
Registrant: DowElanco
Product(s): 20.0% FI (EPA Reg. No. 62719-133)

PRODUCT CHEMISTRY DATA SUMMARY

Guideline Number	Requirement	Are Data Requirements Fulfilled? [a]	MRID Number [b]
61-1	Product Identity and Disclosure of Ingredients	Y [c]	40453701
61-2	Starting Materials and Manufacturing Process	N [d]	40453701
61-3	Discussion of Formation of Impurities	Y [c]	40453701
62-1	Preliminary Analysis	N/A [e]	
62-2	Certification of Ingredient Limits	Y [c]	40675001
62-3	Analytical Methods to Verify the Certified Limits	Y [c]	40675002
63-2	Color	Y	40453702
63-3	Physical State	Y	40453702
63-4	Odor	Y	40453702
63-5	Melting Point	N/A [e]	
63-6	Boiling Point	N/A [e]	
63-7	Density, Bulk Density or Specific Gravity	Y	40453702
63-8	Solubility	N/A [e]	
63-9	Vapor Pressure	N/A [e]	
63-10	Dissociation Constant	N/A [e]	
63-11	Octanol/Water Partition Coefficient	N/A [e]	
63-12	pH	Y	40453702
63-13	Stability	N/A [e]	
63-14	Oxidizing of Reducing Action	Y	40453702
63-15	Flammability	N/A [f]	
63-16	Explodability	Y	40453702
63-17	Storage Stability	Y	40453702
63-18	Viscosity	N/A [f]	
63-19	Miscibility	N/A [f]	
63-20	Corrosion Characteristics	Y	40453702

[a] Y = Yes; N = No; N/A = Not Applicable.

[b] All citations were reviewed in the Trifluralin Reregistration Standard Update dated 10/29/91.

[c] The Update required additional data concerning the impurities of the TGAI; however, this requirement will be satisfied by data for the technical source product.

[d] These data do not fully satisfy the requirements of 40 CFR §158.160-165 (Guideline Reference No. 61-2) concerning starting materials and the manufacturing process because technical specifications of the inerts, duration of the manufacturing process, and a detailed description of the packaging materials used must be provided.

[e] This data requirement will be fulfilled by data for the technical source product.

[f] Data are not required because the MP is a solid at room temperature.

DYNAMAC
CORPORATION
Environmental Services

Final Report

TRIFLURALIN
Shaughnessy No. 036101
Case No. 0179
(CBRS No. 13669, DP Barcode D203167)

Task 2B: Reregistration Eligibility Decision: Residue Chemistry Considerations

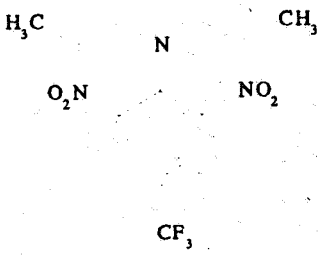
August 10, 1994

Contract No. 68-D4-0010

Submitted to:
U.S. Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
The Dynamac Building
2275 Research Boulevard
Rockville, MD 20850-3268

TRIFLURALIN



REREGISTRATION ELIGIBILITY DECISION

RESIDUE CHEMISTRY CONSIDERATIONS

Shaughnessy No. 036101; Case 0179

(CBRS No. 13669; DP Barcode D203167)

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TRIFLURALIN

REREGISTRATION ELIGIBILITY DECISION

RESIDUE CHEMISTRY CONSIDERATIONS

Shaughnessy No. 036101; Case 0179

(CBRS No. 13669; DP Barcode D203167)

TASK 2B

INTRODUCTION

Trifluralin (α,α,α-trifluoro-2,6-dinitro-*N*,*N*-dipropyl-*p*-toluidine) is a selective preemergence herbicide registered for the control of annual grasses and certain broadleaf weeds under various trade names such as Treflan, Tri-4, Terrific, Clean Crop, Trilin, Gowan, Trifluralin, Trust, and Cornbelt Trifluralin. The manufacturers of trifluralin with United States registration include DowElanco, Makhteshim-Agan (Israel), and Industria Prodotti Chimici (I.Pi.Ci., Italy).

According to the Agency's Reference Files System (REFS), in a search conducted 6/9/94, trifluralin is presently registered for use on a variety of food and feed crops including alfalfa, asparagus, barley, beans (dry), beans (including Adzuki, guar, lima, mung, and snap), Brassica (Cole) leafy vegetables, broccoli, Brussels sprouts, cabbage, cantaloupes, carrots, cauliflower, celery, chicory, citrus fruits (including grapefruit, lemons, oranges, tangelos, and tangerines), collards, corn (field), cotton, cucumbers, cucurbit vegetables, endive, flax, forage legumes, grapes, hops, kale, mustard greens, mustard (grown for seed or processed for food), okra, onions (dry bulb), peanuts, peas (dry or English), peas (green), peas (southern), peppermint, peppers, peppers (chili), potatoes, radishes, rapeseed (canola), safflower, sorghum, soybeans, spearmint, stone fruits (including apricots, nectarines, peaches, plums, and prunes), sugar beets, sugarcane, sunflower, tomatoes, tree nuts (including almonds, pecans, and walnuts), turnip greens (for processing), watermelons, and wheat.

In a 5/17/94 use profile presentation made by DowElanco to the EPA's Trifluralin RED Team, the registrant indicated that 80% of total trifluralin use in the United States is for soybeans and cotton. Sunflowers, dry edible beans and peas, and alfalfa account for 4%, 3%, and 2%, respectively, of the total agricultural uses for trifluralin. The Gulf states, midwest states, and California are the principal regions where trifluralin may be applied.

The formulations registered for food/feed uses are granular (G), dry flowable (DF), and emulsifiable concentrate (EC). Trifluralin is typically applied dormant, semi-dormant, preplant, pretransplant, postplant, preemergence, postemergence, layby, or postharvest as a soil incorporated treatment using ground or aerial equipment.

The information contained in this document summarizes the status of the residue chemistry data requirements with respect to the reregistration of trifluralin.

The Agency has recently updated the Livestock Feeds Table (Table II of the Pesticide Assessment Guidelines, Subdivision O, Residue Chemistry, issued June 1994). Trifluralin residue data are required as a result of changes in the Livestock Feeds Table (TABLE II (June 1994)) and these data requirements have been incorporated into this document. These new data requirements should be imposed at the issuance of the Trifluralin RED but should not impinge on the reregistration eligibility decision for trifluralin. The need for additional tolerances and revisions to exposure/risk assessments will be made upon receipt of required residue chemistry data.

REGULATORY BACKGROUND

Trifluralin was the subject of a Special Review based on risk criteria (carcinogenicity and mutagenicity) which were possibly met or exceeded. A PD 1/2/3 (Position Document) was published in 44 FR 50911 on 8/30/79 and a PD 4 was published in 47 FR 33777 on 8/4/82. The Special Review concluded that trifluralin reregistration will be allowed, if among other requirements, the total N-nitrosamine contamination is kept below 0.5 ppm for technical products and below a figure based on trifluralin content for formulated products; refer to the Product Chemistry Chapter for additional regulatory background information regarding this topic.

The Trifluralin Reregistration Standard Guidance Document was issued 4/87 based on the Trifluralin Reregistration Standard Science Chapter dated 7/12/85. The Trifluralin Product and Residue Reregistration Update was completed 10/29/91.

Tolerances are established for residues of trifluralin (α,α,α-trifluoro-2,6-dinitro-*N*,*N*-dipropyl-*p*-toluidine) in/on numerous raw agricultural commodities [40 CFR §180.207] and peppermint oil and spearmint oil [§185.5900]. These tolerances range from 0.05 ppm to 2.0 ppm. Adequate enforcement methods are available for the determination of trifluralin residues in/on plant commodities. Tolerances for residues of trifluralin in animal commodities have not been established and are not needed.

Trifluralin was one of the pesticides that has established tolerances under section 409(f) of the FFDCA which was challenged in court because of Delaney issues, as indicated in a petition previously filed by NRDC. A final rule to revoke the food additive tolerances for residues of trifluralin in peppermint oil and spearmint oil [§185.5900] was issued with an effective date of 8/30/93. In response to the 8/13/93 objections and hearing and stay requests filed by NACA and other registrants to a final rule revoking certain food additive tolerances, the Agency has decided to stay the effective date indefinitely (59 FR 33684, 6/30/94).

SUMMARY OF SCIENCE FINDINGS

GLN 171-3: Directions for Use

A REFS search conducted 6/9/94 indicated that there are 12 trifluralin end-use products (EPs) with food/feed uses registered to the Trifluralin Consortium consisting of DowElanco, Industria Prodotti Chimici S.P.A. (I.Pi.Ci.), and Makhteshim-Agan of North America, Inc.. These EPs are presented below.

Registrant EPA Reg. No.	Acceptance Date	Formulation Class	Product Name
DowElanco			
62719-93 [a]	4/21/94	4 lb/gal EC	Treflan E.C.
62719-97	1/27/94	4 lb/gal EC	Treflan E.C. Weed and Grass Preventer
62719-116 [b]	4/20/94	4 lb/gal EC	Treflan M.T.F.
62719-118 [c]	4/20/94	5 lb/gal EC	Treflan 5
62719-131 [d]	4/20/94	10% G	Treflan TR-10
62719-216 [e]	6/21/93	80% DF	Treflan 80 D.C.
62719-222	10/20/93	3.4 lb/gal EC	Broadstrike + Treflan
62719-241	10/15/93	4 lb/gal EC	Legacy
Industria Prodotti Chimici S.P.A.			
33660-31	5/31/94	4 lb/gal EC	Flutrix Five EC
33660-32	5/31/94	4 lb/gal EC	Flutrix 4 EC ATT
33660-33	1/15/90 [f]	4 lb/gal EC	Flutrix 4 EC
Makhteshim-Agan of North America, Inc.			
66222-13 [g]	1/27/94	4 lb/gal EC	Triflurex (Trifluralin) 4 EC

[a] Including SLN Nos. ID80001600, ID82000700, MS81001900, NM90000200, OR80003100, OR82001200, TX93000100, WA80003000, and WA82001100.

[b] Including SLN Nos. ID82000800, OR82001100, and WA82001200.

[c] Including SLN Nos. AZ92000300, NM90000400, and TX93000200.

[d] Including SLN Nos. CA87002900, NE87000800, NM87000600, NM91000100, NV90000100, OR90001900, TX93000300, UT87000200, UT90000100, and WA90001600.

[e] EPA Reg. No. 62719-216 is coded by REFS as an emulsifiable concentrate (EC) formulation. However, an examination of this product's use directions and Confidential Statement of Formula indicates that the appropriate formulation classification for this product should be dry flowable (DF).

[f] A copy of the label was obtained from a Product Label DCI dated 1/15/90.

[g] EPA Reg. No. 66222-13 is coded by REFs as a soluble concentrate (SC/L) formulation. However, an examination of this product's use directions indicates that the appropriate formulation classification for this product should be an emulsifiable concentrate (EC).

A comprehensive summary of the registered food/feed use patterns of trifluralin, based on the product labels registered to the Trifluralin Consortium, is presented in Table A. Table A also includes the registered uses of trifluralin on alfalfa grown for seed, castor beans, crambe grown for seed, and nonbearing fruit and nut crops which are classified as non-food/feed uses. Trifluralin uses on these crops are classified as non-food/feed for reasons listed below.

Sites	Formulation (EPA Reg. No.)	Justifications for Non-Food/Feed Designation
Nonbearing fruit and nut crops [including almonds, apples, apricots, avocado, blackberries, blueberries, boysenberries, cherries (sour and sweet), currants, dewberries, elderberries, figs, filberts, gooseberries, grapefruit, kiwi, lemons, loganberries, macadamia nut, nectarines, olive, sweet oranges, peaches, pears, pecans, pistachios, plums, pomegranate, prune, raspberries, walnuts (black and English)] and nonbearing vineyards [including American grape and European grape]	2 and 5% G (62719-98 and 62719-175, respectively)	The label defines the term nonbearing as plants which will not bear fruit for at least one year.
Alfalfa grown for seed	10% G (NV90000100, OR90001900, UT90000100, WA90001600)	The label restricts against use of alfalfa seed for human or animal consumption and the use of alfalfa forage, hay, or seed by-products for food/feed. Adequate label instructions for disposal of unused alfalfa commodities are provided.
Castor beans	10% G (62719-131) 4 and 5 lb/gal EC (62719-93, 62719-116, 62719-118, 62719-241)	Castor beans and its oil products are not consumed by humans or livestock.
Crambe grown for seed	4 and 5 lb/gal EC (IA88000200, MO88000300, and NE88000200)	Classified as non-food/feed use based on the low volume of use and the limited value of the defatted crambe seed meal as a livestock protein feed supplement. The labels carry restrictions against grazing, foraging, or feeding seed.

A tabular summary of the residue chemistry science assessments for reregistration of trifluralin is presented in Table B. The conclusions listed in Table B regarding the reregistration eligibility of trifluralin food/feed uses are based on the use patterns registered to the members of the Trifluralin Consortium only. When end-use product DCIs are developed (e.g., at issuance of the RED), RD should require that all end-use product labels (e.g., MAI labels, SLNs, and products subject to the generic data exemption) be amended such that they are consistent with the basic producer labels.

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GLN 171-4 (a): Plant Metabolism

The qualitative nature of the residue in plants is adequately understood based on acceptable field corn and mustard green metabolism studies supported by supplemental carrot, cotton, peanut, soybean, and sweet potato metabolism data. The residue of concern in plants is trifluralin *per se* and the current tolerance expression for plants is adequate.

In the *field corn metabolism study*, the total radioactive residues (TRR), expressed as trifluralin equivalents, found following spray over the top application with an EC formulation of uniformly ring labeled [^{14}C]trifluralin and unlabeled trifluralin at 0.75 lb ai/A (0.75x the maximum registered rate) and 1.5 lb ai/A (1.5x the maximum registered rate) are listed below.

Commodity	Sampling Interval (Days)	TRR (ppm, expressed as trifluralin equivalents)	
		0.75x	1.5x
Forage	0	48.2	107.0
	7	2.27	4.59
	14	0.851	2.12
	29	0.332	0.658
Silage	63	0.126	0.444
Grain	82	ND	0.020
Cob	82	ND	0.020
Fodder	106	0.500	0.932

Because there was very little, if any, residue translocation to corn grain or cob, no residue characterization was conducted in these commodities. Trifluralin was the predominant residue in corn forage. Smaller amounts of conjugates C1 (N-[2-Ethyl-1-propyl-5-(trifluoromethyl)-1H-benzimidazol-7-yl]-β-D-glucopyranosylamine) and C2 (N-[2-Ethyl-1-propyl-5-(trifluoromethyl)-1H-benzimidazol-7-yl]-α-D-glucopyranosylamine) as well as the metabolite TR-4 (α,α,α-trifluoro-5-nitro-N^4,N^4,-dipropyltoluene-3,4-diamine) were identified in forage. It was concluded that residues on corn plants were converted from nonpolar to polar compounds and subsequently incorporated into insoluble forms including cell wall components.

In the *mustard green metabolism study*, mustard seed was planted under greenhouse conditions in soil treated with a solution of uniformly ring labeled [^{14}C]trifluralin and unlabeled trifluralin at 1.323 ppm (calculated to be equivalent to 2.6x the maximum registered rate). The TRR in mature mustard leaves and roots harvested 8 weeks after planting were 0.126 and 0.816 ppm, respectively. The major residue identified in leaves was trifluralin representing 9.3% of TRR (i.e., 0.01 ppm). Metabolite TR-22 accounted for

0.9% of TRR; it was concluded that this metabolite is unlikely to be present at the maximum registered rate. Lignin and cellulose fractions collectively accounted for 27.4% of TRR.

The *carrot, cotton, peanut, soybean, and sweet potato metabolism studies* were deemed inadequate to satisfy reregistration requirements, but provide supplementary evidence that the residue of concern in plants is trifluralin *per se*.

GLN 171-4 (b): Animal Metabolism

The qualitative nature of the residue in animals is adequately understood based on acceptable poultry and ruminant metabolism studies reflecting oral exposure. Studies conducted at various feeding levels (including exaggerated levels) indicate that finite trifluralin residues are not expected to occur in animal commodities. Although radioactive residues in animal tissues, milk, and eggs from exaggerated feeding levels were incompletely characterized, the Agency did not require further analytical work given the low levels of radioactive residues expected to result from the maximum theoretical dietary intake and concluded that there was no reasonable expectation of finite residues of trifluralin in animal commodities. The maximum intake by beef cattle was calculated to be 0.09 ppm based on a diet consisting of 25% alfalfa hay, 5% peanut hulls, and 70% corn grain. The maximum intake by dairy cattle was calculated to be 0.17 ppm based on a diet consisting of 80% alfalfa hay and 20% corn grain. The maximum intake by poultry was calculated to be 0.05 ppm based on a diet consisting of 70% corn grain and 30% soybeans. Thus the Agency decided that there was no need for tolerances for trifluralin residues in meat, milk, poultry and eggs as prescribed under 40 CFR §180.6(a)(3).

Subsequent to the above decision, the Agency updated the Livestock Feeds Table (TABLE II (June 1994)) and issued additional guidance on calculating livestock dietary exposure (issued June 1994). Also the registrant proposed a large increase in the maximum application rate to alfalfa (a major feed for beef and dairy cattle) and correspondingly requested large increases in the tolerance levels for alfalfa forage and hay (1 ppm and 3 ppm, respectively). Thus the maximum dietary intake of trifluralin by livestock has been recalculated based on current information to determine if these new estimates alter the Agency's position on the need for tolerances for trifluralin residues in meat, milk, poultry, and eggs.

Assuming that the established tolerance for alfalfa hay is increased to 3 ppm as proposed by the registrant: (i) the current maximum dietary exposure estimate for residues of trifluralin by beef cattle is 0.89 ppm based on a diet consisting of 25% alfalfa hay, 15% peanut hulls, and 60% field corn grain and (ii) the current maximum dietary exposure estimate for residues of trifluralin by dairy cattle is 2.38 ppm based on a diet consisting of 70% alfalfa hay and 30% field corn grain. The current maximum dietary exposure estimate for residues of trifluralin by poultry is 0.05 ppm based on a diet consisting of 80% field corn grain and 20% soybeans.

In the *ruminant metabolism study*, a Hereford steer and a crossbred steer were dosed with uniformly ring-labeled [^{14}C]trifluralin at 0.875 ppm (1x the current maximum dietary burden calculation) and 8.75 ppm (10x) in the diet for five and three days, respectively. A Holstein dairy cow was dosed with uniformly ring-labeled [^{14}C]trifluralin at 1.7 ppm (0.7x) and 17 ppm (7x) in the diet for five and three consecutive days, respectively. Total radioactive residues (TRR) were <0.01 ppm fat, kidney, and muscle, and 0.014 ppm in liver from cattle administered [^{14}C]trifluralin at 1x. Total radioactive residues were 0.0016 ppm and 0.0111 ppm in milk from cattle administered [^{14}C]trifluralin at 0.7x and 7x, respectively. It is, therefore, expected that radioactive residues resulting from dosing at 1x will be lower than <0.01 ppm in milk and all edible tissues except liver. Characterization of the TRR in liver samples revealed that 82% of the TRR was extractable and 12% of the TRR was unextractable. Limited attempts at identification of the residues extracted into ethyl acetate (pH 8) revealed seven components each containing 1% to 6.3% of the TRR (<0.001 ppm trifluralin equivalent based on a 1x dose rate).

In the *poultry metabolism study*, laying hens were dosed with uniformly ring labeled [^{14}C]trifluralin at 0.05 ppm (1x the current maximum dietary burden calculation) and 0.5 ppm (10x) in the diet for five consecutive days, or 50 ppm (1,000x) for ten consecutive days. Total radioactive residues (TRR) were nondetectable in muscle (<0.003 ppm), skin plus fat (<0.003 ppm), and eggs (<0.001 ppm) and 0.004 ppm in liver from hens dosed at 1x.

The Agency hereby concludes that although radioactive residues in animal tissues, milk, and eggs from exaggerated feeding levels were incompletely characterized, the Agency does not require further analytical work given the low levels of radioactive residues expected to result from the current maximum theoretical dietary exposure estimates and concludes that there is no reasonable expectation of finite residues of trifluralin in animal commodities. Therefore, there is no need for tolerances for trifluralin residues in meat, milk, poultry and eggs as prescribed under 40 CFR §180.6(a)(3).

GLN 171-4 (c) and (d): Residue Analytical Methods - Plants and Animals

The reregistration requirements for residue analytical methods are fulfilled. Adequate methods are available for data collection and enforcement of tolerances for residues of trifluralin *per se* in/on plant commodities. The requirement for analytical method(s) for animal commodities is waived (Greybeard Committee, 2/2/94).

Tolerance enforcement methods: The Pesticide Analytical Manual (PAM, Vol. II, Section 180.207) lists four GC methods (designated as Methods I, II, III, and A) with electron capture detection (ECD) and a detection limit of 0.005-0.01 ppm, as available for determination of trifluralin *per se* in/on plant commodities. Method I in PAM, Vol. II is a multiresidue method listed in PAM, Vol. I, Sections 211.1 (fatty) and 212.1 (nonfatty) for organochlorine compounds.

Data collection methods: Adequate methods for analysis of trifluralin in/on plant

commodities are available. Procedure numbers 5801000 and 5801210 and their modifications, such as procedure number 5801616 are GC methods using ECD. Minor procedures, designed for particular crops and/or used only for a small part of data collection, included procedure number 5801160, used for analysis of peanut meats and safflower oil and seed, procedure number 5800600 used for analysis of tomatoes, procedure number 5801577 used for analysis of mint oil, and a nondesignated procedure of Monsanto Company for the analysis of trifluralin in oil seed crops which involved extraction with iso-octane and cleanup with alumina column. Other data collection methods were procedure number MMS-R-274-1 (Shell Chemical Company) used for analysis of soybeans and their processed fractions and a nondesignated procedure of the International Research Project Number 4 used for data collection in rape seed and straw. Procedure number 5801110, which incorporates a TLC cleanup step, is the preferred regulatory method when interfering pesticides are present in crop samples.

Procedure numbers 5801210, 5801110, and 5801577 of Eli Lilly and Company are listed in PAM, Vol. II as Methods II, III, and A, respectively. Procedure number 5801210 (designated as Method II) was subjected to an Agency validation trial. The Eli Lilly Method AM-AA-CA-RO23-AA-755 was used for the generation of trifluralin residue data in various plant commodities. This method is a modification to procedure number 5801616 which is a modification of procedure number 5801210 (designated as Method II). The modifications include different dilution solvents and GC columns. In addition, GC/ECD methods AM-AA-CA-R146-AA-755, GRM92.11, and TFN0291 are modifications of method AM-AA-CA-RO23-AA-755 and are adequate for collecting data on residues of trifluralin in/on various plant commodities.

Multiresidue method(s): The FDA PESTDATA database dated 1/94 (PAM Vol. I, Appendix II) indicates that trifluralin is completely recovered (>80%) using multiresidue method PAM Vol. I Sections 302 (Luke method), 303 (Mills, Onley, Gaither method) and 304 (Mills fatty food method).

GLN 171-4 (e): Storage Stability

The requirements for storage stability data are not fully satisfied. Information concerning sample storage intervals and conditions for numerous magnitude of the residue studies previously submitted and reviewed in the Trifluralin Registration Standard (7/12/85) remains outstanding. The Agency has recently provided clarification of this requirement to the registrant by specifying which magnitude of the residue studies need additional sample storage information (CBRS No. None, DP Barcode No. D207243, 9/14/94, B. Cropp-Kohlligian). This information is considered confirmatory but is important to tolerance reassessment and would increase our confidence with respect to risk assessment.

Acceptable storage stability studies have been conducted on representative oil seeds, non-oily grains, leafy vegetables, root and bulb crops, fruits and fruiting vegetables, legume vegetables (succulent or dried), low moisture content forage/hay, and miscellaneous

commodities including mustard seed, sugarcane, and green hops. Additional studies have also been conducted to investigate the frozen stability of trifluralin in selected processed food/feed commodities. These data adequately demonstrate that residues of trifluralin are stable in/on plant matrices for intervals up to 554 days at frozen temperatures. However, storage stability data also indicate a potential for trifluralin residue decline for commodities stored at elevated temperatures (4°C to room temperature).

Outstanding field trials and processing studies must have supporting storage stability data. The Agency prefers that concurrent storage stability studies be conducted.

GLN 171-4 (k): Magnitude of the Residue in Plants

The majority of the residue field trials were conducted using a representative EC formulation and a few additional trials were made using a G formulation. There are no data reflecting the use of a registered trifluralin DF formulation. However, considering the registered timing of application of trifluralin on food/feed crops and because the product is directed to the soil and incorporated, residue data reflecting DF formulation will not be required.

The reregistration requirements for magnitude of the residue in plants are fulfilled for the following commodities: almonds (hull and nutmeats); apricots; asparagus; barley (forage, grain, hay, and straw); beans (succulent, seed, forage, and straw/hay); broccoli; Brussels sprouts; cabbage; cantaloupes; cauliflower; carrots; celery; cherries; chicory (roots and tops); collards; corn (grain and aspirated grain fractions); cotton (seed); cucumbers; endive; flax (seed); garlic; grapefruit; grapes; hops; kale; lemons; mustard (greens and seed); nectarines; okra; onions (bulb and green); oranges; peaches; peanuts (nutmeats, hay, and hulls); peas (succulent, seed, vines, and hay); pecans; peppermint (hay); peppers; plums; potatoes; radishes (roots and tops); rape (seed); safflower (seed); sorghum (forage, grain, fodder, and aspirated grain fractions); soybeans (seed, forage, hay, and aspirated grain fractions); spearmint (hay); squash (summer), sugar beets (roots and tops); sugarcane; sunflower (seed); tangelos; tangerines; tomatoes; turnips (roots and tops); walnuts; watermelon; and wheat (forage, grain, hay, straw, and aspirated grain fractions). Adequate field trial data depicting residues of trifluralin following treatments according to the maximum registered use patterns have been submitted for the commodities listed above or have been translated where appropriate.

The Agency no longer recognizes cotton forage, peanut vines, rape straw, and sugarcane forage as raw agricultural commodities (TABLE II (June 1994)). Therefore no residue data are required for these commodities.

The residue study on corn forage, fodder, and silage is adequate pending submission of acceptable data validating the analytical method (Method No. GRM92.11) at or below the established 0.05 ppm tolerance level.

Additional alfalfa forage, alfalfa hay, flax straw, and sunflower forage data are required to

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support the reregistration of trifluralin.

Although the Agency currently recognizes radish tops, rape greens, bean sprouts, and the aspirated grain fractions of corn, sorghum, soybeans, and wheat as raw agricultural commodities and has determined that label restrictions for peanut hay, rape forage and safflower forage are not appropriate (TABLE II (June 1994)), no additional residue data are required for these commodities. Radish tops and rape greens data are not required to support root and tuber and Brassica (cole) leafy vegetable crop group tolerances, respectively. Data on mung bean sprouts are not required since there is no registered uses for trifluralin on mung bean sprouts *per se*. Available soybean, corn, and wheat grain dust data adequately demonstrate that residues of trifluralin are not likely to concentrate in the aspirated grain fractions of corn, sorghum, soybeans, and wheat. Adequate peanut hay data are available. The required data for sunflower forage will be translated to rape forage and safflower forage.

The Agency currently recognizes cotton gin byproducts (commonly called gin trash) as a raw agricultural commodity of cotton (TABLE II (June 1994)) and residue data are hereby required depicting residues of trifluralin in/on cotton gin byproducts resulting from maximum registered use rate to cotton. A minimum of six (6) field trials are required. For additional guidance on sampling and geographical locations for field trials the registrant should consult "EPA Guidance on Number and Location of Domestic Crop Field Trials for Establishment of Pesticide Residue Tolerances" issued 6/2/94.

Trifluralin residue data requirements for cotton gin byproducts which result from changes in the Livestock Feeds Table (TABLE II (June 1994)) should be imposed at the issuance of the Trifluralin RED but should not impinge on the reregistration eligibility decision of trifluralin. The need for additional tolerances and revisions to the exposure/risk assessments will be made upon receipt and evaluation of required data.

GLN 171-4 (l): Magnitude of the Residue in Processed Food/Feed

Adequate processing studies have been conducted, to determine the potential for the concentration or reduction of trifluralin residues in the processed commodities of the following RACs: cottonseed, field corn, oranges, peanuts, sorghum, soybeans, sugar beets, sugarcane, sunflower seed, and wheat.

Available wheat processing data have been translated to barley processed commodities.

Available cottonseed processing data have been translated to flax processed commodities.

Available sunflower seed processing data have been translated to rape seed and safflower processed commodities.

Acceptable field trials have been conducted at exaggerated application rates (up to 5x) which

are adequate to demonstrate that residues of trifluralin are not likely to concentrate in the processed commodities of the following RACs: grapes, hops, plums, and tomatoes.

Potato processing data (MRID 42514501) have previously been reviewed by the Agency (CBRS No. 10781, DP Barcode 183828, 5/6/93, A. Aikens) and deemed adequate to satisfy data requirements. These data demonstrate that residues of trifluralin do not concentrate in flakes and chips but do concentrate in wet peel (5x) and dried peel (280x). [Note: Concentration factor demonstrated by potato dry peel data exceeds the maximum theoretical concentration factor for potatoes estimated by the previous data reviewer at 50x.] Based on the submitted potato processing study, the Agency recommended that a feed additive tolerance for residues of trifluralin in processed potato waste should be established using the maximum theoretical concentration of residues in dry peel. However, since that time, the Agency has Updated the Livestock Feeds Table for Subdivision O (TABLE II (June 1994)) and now establishes feed additive tolerances for processed potato waste based on the maximum concentration factor observed for residues in/on wet peel. Because the potato processing study was conducted at exaggerated application rates (up to 5x) resulting in trifluralin residue levels in/on processed wet potato peel samples (ranging from <0.05 ppm to 0.05 ppm) equal to or below the currently established tolerance for potatoes (0.05 ppm), the Agency hereby concludes that a feed additive tolerance for residues of trifluralin in/on processed potato waste is not required. The currently established tolerance for residues of trifluralin in/on potatoes will apply to processed potato waste.

The Agency no longer recognizes any processed commodities of alfalfa and beans (TABLE II (June 1994)). No alfalfa or bean processing data are required.

Peppermint and spearmint processing data requirements remain outstanding. [Note: Since Trifluralin is a carcinogen and subject to the Delaney clause of FFDCA, CBRS defers to OGC regarding the legal ramifications of the presently established and needed trifluralin food/feed additive tolerances.]

GLN 171-4 (j): Magnitude of the Residue in Meat, Milk, Poultry, and Eggs

The data requirements for magnitude of trifluralin residue in meat, milk, poultry, and eggs have been waived based on the low levels of radioactive residues from the animal metabolism studies. This is considered to be a 40 CFR §180.6 category 3 with respect to the need for tolerances for trifluralin residues in meat, milk, poultry and eggs.

GLNs 165-1 and 165-2: Confined/Field Rotational Crops

A confined rotational crop study (GLN 165-1) has been submitted and is currently under review by the Agency. The need for limited or extensive field trials (165-2) and the establishment of appropriate plantback intervals, if needed, are reserved pending the results of the confined rotational crop study.

TABLE A. FOOD/FEED USE PATTERNS SUBJECT TO REREGISTRATION FOR TRIFLURALIN (CASE 0179).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,5]
Alfalfa (established)					
Soil incorporated treatment Dormant or during the growing season (after a cutting) Ground or aerial equipment	10% G [62719-131]	2 lb/A	(1)	Not applicable (NA)	
Soil incorporated treatment Dormant, late dormant, or during the growing season (after a cutting) Ground or aerial equipment	10% G [NE87000800] [NM87000600] [UT87000200]	2 lb/A	2	60	Use limited to NE, NM, and UT.
Soil incorporated treatment Prior to weed emergence Ground or aerial equipment	10% G [CA87002900]	2 lb/A	2	60	Use limited to CA.
Soil incorporated treatment Dormant, semi-dormant, or during the growing season (after a cutting) Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	2 lb/A	(1)	NA	A 21-day PHI/PGI has been established. A maximum seasonal rate of 2 lb ai/A is in effect. Application rate is dependent on the soil type. Application may be made alone or as a tank mix with other herbicides.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Alfalfa (established) (continued)					
Soil incorporated treatment Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] [66222-13] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Use limited to western U.S.. Application rate is dependent on the soil type.
Alfalfa (grown for seed only)					
Soil incorporated treatment Late winter or spring Ground equipment	10% G [NV90000100] [OR90001900] [UT90000100] [WA90001600]	4 lb/A	(1)	NA	Nonfood use limited to NV, OR, UT, and WA. The following uses are prohibited: (i) use of alfalfa seed for human or animal consumption and the use of alfalfa forage, hay, or seed by-products for food/feed; (ii) grazing or cutting alfalfa for hay or forage following an application rate of >2 lb ai/A; (iii) use of harvested seed for sprouting.
Almonds (see "Tree nuts.")					
Apricots (see "Stone fruits.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Asparagus (established)					
Soil incorporated treatment Dormant (before spear emergence) or postharvest (before fern development) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	2 lb/A (single application) or 1 lb/A (split applications)	1 or 2	Not specified (NS)	Application rate is dependent on the soil type.
Soil incorporated treatment Before spear emergence Ground equipment	4 lb/gal EC [62719-97]	1 lb/A	1	NA	Application rate is dependent on the soil type.
Barley					
Soil incorporated treatment Fall Ground or aerial equipment	10% G [62719-131]	0.75 lb/A	(1)	NA	Use limited to MN, ND, and SD.
Soil incorporated treatment Fall Ground or aerial equipment	80% DF [62719-216]	0.75 lb/A	(1)	NA	

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Barley (continued)					
Soil incorporated treatment Spring (preplant) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.5 lb/A (10% G) (80% DF) (4 lb/gal EC) 0.63 lb/A (5 lb/gal EC)	(1)	NA	Use limited to MN, ND, and SD.
Soil incorporated treatment Spring (preplant) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Use limited to barley used as cover crops or in the Acreage Conservation Reserve Program.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Barley (continued)					
Soil incorporated treatment Postplant, preemergence Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. Application may be made alone or as a tank mix with other herbicides.
Soil incorporated treatment Summer fallow period Ground or aerial equipment	10% G [62719-131]	0.5-1 lb/A	(1)	NA	Application rate is dependent on application date.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Beans, dry					
Soil incorporated treatment Spring (preplant) or fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides.
Soil incorporated treatment Preplant Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] [66222-13] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. Application may be made alone or as a tank mix with other herbicides. The feeding or grazing of foliage treated with the tank mix is prohibited.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Beans, dry (continued)					
Soil incorporated treatment Fall Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] [66222-13] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Use limited to ID, OR, and WA. Application rate is dependent on the soil type.
Beans (including Adzuki, guar, lima, mung, and snap)					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-33] [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.

(continued; footnotes follow.)

TABLE A *(continued)*.

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Brassica (Cole) leafy vegetables					
Soil incorporated treatment Preplant (direct seeded) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Brassica (Cole) leafy vegetables (continued)					
Soil incorporated treatment Pre-transplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.
Broccoli (See "Brassica (Cole) leafy vegetables.")					
Brussels sprouts (See "Brassica (Cole) leafy vegetables.")					
Cabbage (See "Brassica (Cole) leafy vegetables.")					
Cantaloupes (See"Cucurbit vegetables.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Carrots					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.
Soil incorporated treatment Preplant, at-plant, or postplant Ground equipment	4 lb/gal EC [62719-97]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Castor Bean					
Soil incorporated treatment Preplant or postplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.
Soil incorporated treatment Preplant Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] 66222-13] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. Application may be made alone or as a tank mix with other herbicides. The feeding or grazing of foliage treated with the tank mix is prohibited.
Soil incorporated treatment Fall Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Use limited to ID, OR, and WA. Application rate is dependent on the soil type.
Cauliflower (See "Brassica (Cole) leafy vegetables.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Celery					
Soil incorporated treatment Preplant, at-plant, or postplant (direct seeded or transplant) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-97] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.
Soil incorporated treatment Preplant (direct seeded or transplant) Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Chicory					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62179-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A *(continued)*.

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Citrus fruits (including grapefruit, lemons, oranges, tangelos, and tangerines)					
Soil incorporated treatment Preplant (new plantings) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A *(continued)*.

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Citrus fruits (including grapefruit, lemons, oranges, tangelos, and tangerines) (continued)					
Soil incorporated treatment (directed spray) Bearing and nonbearing established plantings Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Citrus fruits (including grapefruit, lemons, oranges, tangelos, and tangerines) (continued)					
Soil incorporated treatment Bearing and nonbearing established plantings Subsurface injection equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Use limited to CA.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Applicafion Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Collards					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Corn, field					
Soil incorporated treatment (directed or over-the-top spray) Postemergence Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application to sweet corn and corn grown for seed is prohibited. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides. Application rate is dependent on the soil type.
Cotton					
Soil incorporated treatment Spring Ground or aerial equipment	10% G [62719-131]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.
Soil incorporated treatment Spring Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1.25 lb/A	(1)	NA	Application rate is dependent on the soil type. Application may be made alone or as a tank mix with other herbicides.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Cotton (continued)					
Soil incorporated treatment Preplant, postplant, or preemergence Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.25 lb/A	(1)	NA	Application rate is dependent on the soil type. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Cotton (continued)					
Soil incorporated treatment Fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.25 lb/A	(1)	NA	Use limited to AL, AR, AZ, CA, northern FL, GA, LA, MS, southeastern MO (Bootheel), NC, NM, NV, OK, SC, TN, and TX. The 5 lb/gal EC (EPA Reg. No. 62719-118) formulation is registered for use in eastern cotton producing areas at a maximum rate of 1 lb ai/A. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Cotton (continued)					
Soil incorporated treatment (directed spray) Postemergence to layby Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.25 lb/A	(1)	NA	A 90-day PHI has been established. Application may be made from 4 true leaf stage up to layby. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Cotton (continued)					
Soil incorporated treatment Preplant Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.5 lb/A	(1)	NA	Use limited to LA for control of pigweed and seedling johnsongrass.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Cotton (continued)					
Soil incorporated treatment Preplant Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.5 lb/A	(1)	NA	Use limited to TX Gulf Coast Counties.
Soil incorporated treatment Spring (preplant) or fall Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	2	NS	Use limited to all cotton producing states except AZ and CA for control of rhizome johnsongrass. Two year treatment program which consists of a double rate application for two consecutive years. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Cotton (continued)					
Soil incorporated treatment Fall Ground or aerial equipment	80% DF [62719-216]	2 lb/A	(1)	NA	Use limited to TX on fine textured soils.
Soil incorporated treatment Fall Ground or aerial equipment	80% DF [62719-216]	2 lb/A	(1)	NA	Use limited to AR, LA, and MS.
Crambe (grown for seed only)					
Soil incorporated treatment Spring (preplant) Ground equipment	4 lb/gal EC [IA88000200] [MO88000300] [NE88000200] 5 lb/gal EC [IA88000200] [MO88000300] [NE88000200]	1 lb/A	(1)	NA	Nonfood use limited to IA, MO, and NE. The grazing or harvesting of forage or seed for livestock feed is prohibited.
Cucumbers (See "Cucurbit vegetables.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps..	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Cucurbit vegetables					
Soil incorporated treatment (directed spray) Postemergence Ground or aerial equipment	80% DF [62719-216] 10% G [62719-131] 4 lb/gal EC [62719-93] [62719-97] [62719-116] [62719-241]	1 lb/A	(1)	NA	Application may be made to plants in the 3 to 4 true leaf stage. Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.
Soil incorporated treatment (directed spray) Postemergence Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] [66222-13] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Use limited to western U.S. including TX. Application may be made to plants in the 3 to 4 true leaf stage. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Endive					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.
Flax					
Soil incorporated treatment Fall (preplant) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Forage legumes					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Use limited to forage legumes used as cover crops or in the Acreage Conservation Reserve Program.

(continued; footnotes follow.)

TABLE A *(continued)*.

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Grapes					
Soil incorporated treatment Preplant (new plantings) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Grapes (continued)					
Soil incorporated treatment (directed spray) Bearing and nonbearing established plantings Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	A 60-day PHI has been established. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Grapes (continued)					
Soil incorporated treatment Bearing and nonbearing established plantings Subsurface injection equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Use limited to CA.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Hops					
Soil incorporated treatment Dormant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118] [33660-31]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. Use limited to western U.S. for the 4 lb/gal EC (EPA Reg. Nos. 33660-32, 33660-33, and 66222-13) and 5 lb/gal EC (EPA Reg. No. 33660-31) formulations.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Kale					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Mustard greens					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Mustard (grown for seed or processed for food)					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. Use limited to MN and ND for the 4 lb/gal EC (EPA Reg. No. 66222-13) formulation.
Nectarines (See "Stone fruits.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Okra					
Soil incorporated treatment Preplant or postplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Onions, dry bulb (only)					
Soil incorporated treatment (directed spray) Postemergence Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.63 lb/A	(1)	NA	A 60-day PHI has been established. Application rate is dependent on the soil type.
Soil incorporated treatment (directed spray) At layby Ground equipment	4 lb/gal EC [ID80001600] [OR80003100] [WA80003000]	0.63 lb/A	(1)	NA	Use limited to ID, OR, and WA. Application rate is dependent on the soil type.
Peaches (See "Stone fruits.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Peanuts					
Soil incorporated treatment Preplant, at-plant, or postplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Use limited to NM, OK, and TX on Spanish peanuts, Florunner, and Florigiant varieties. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides.
Soil incorporated treatment Preplant, at-plant, or postplant Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] [66222-13] 5 lb/gal EC [33660-31]	0.5 lb/A	(1)	NA	Use limited to OK and TX on Spanish peanuts. Application may be made alone or as a tank mix with other herbicides.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Peas, dry or English					
Soil incorporated treatment Spring (preplant) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides for use limited to ID, OR, and WA.

(continued; footnotes follow.)

TABLE A *(continued)*.

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Peas, dry or English (continued)					
Soil incorporated treatment Fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	Use limited to ID, OR, and WA. Application rate is dependent on the soil type. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides.
Peas, green					
Soil incorporated treatment Preplant Ground equipment	4 lb/gal EC [62719-97]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Peas, southern					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.
Pecans (See "Tree nuts.")					
Peppermint (established)					
Soil incorporated treatment Dormant Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] 5 lb/gal EC [33660-31]	0.75 lb/A	(1)	NA	Use limited to ID, OR, and WA. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Peppers					
Soil incorporated treatment Pretransplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.
Peppers, chili					
Soil incorporated treatment (directed spray) Postemergence Ground equipment	5 lb/gal EC [NM90000400]	1.25 lb/A	NS	NS	Use limited to NM. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Peppers, chili (continued)					
Soil incorporated treatment (directed spray) Postemergence Ground equipment	10% G [NM91000100] [TX93000300] 4 lb/gal EC [NM90000200] [TX93000100] [TX93000200]	1 lb/A	NS	NS	Use limited to NM and TX. Application rate is dependent on the soil type.
Soil incorporated treatment (directed spray) Postemergence Ground equipment	5 lb/gal EC [AZ92000300]	0.75 lb/A	NS	NS	Use limited to AZ. Application rate is dependent on the soil type.
Plums (See "Stone fruits.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Potatoes					
Soil incorporated treatment Postplant, preemergence, immediately following drag-off, or after potato plant have fully emerged Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Use prohibited in ME. Application rate is dependent on the soil type. Application of the 80% DF and the 4 and 5 lb/gal EC (EPA Reg. Nos. 33660-31, 33660-32, 33660-33, 62719-93, 62719-116, 62719-118, 62719-241, and 66222-13) formulations may be made alone or as a tank mix with other herbicides. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.
Prunes (See "Stone fruits.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Radishes					
Soil incorporated treatment Preplant Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type.
Radishes (grown for seed)					
Soil incorporated treatment Preplant Ground equipment	4 lb/gal EC [ID82000700] [ID82000800] [OR82001100] [OR82001200] [WA82001100] [WA82001200]	0.75 lb/A	(1)	NA	Use limited to ID, OR, and WA. Application rate is dependent on the soil type. The use of treated crop or crop residues for food/feed or use of seed screenings for feed is prohibited (WA82001200).

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Rapeseed (canola)					
Soil incorporated treatment Spring (preplant) or fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Use prohibited in AK. Application rate is dependent on the soil type.
Soil incorporated treatment Spring, late summer, or fall Ground or aerial equipment	80% DF [62719-216]	1 lb/A	(1)	NA	Use prohibited in AK. Application rate is dependent on the soil type. The grazing or harvesting of treated crop for livestock forage is prohibited.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Safflower					
Soil incorporated treatment Spring (preplant) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.25 lb/A 1 lb/A (EPA Reg. No. 66222-13)	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A *(continued)*.

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Safflower (continued)					
Soil incorporated treatment Fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.25 lb/A	(1)	NA	Use limited to AZ, CA, ID, NV, OR, UT, WA, and WY. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Sorghum					
Soil incorporated treatment (directed or over-the-top spray) Postemergence Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Soybeans					
Soil incorporated treatment Spring (preplant) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.25 lb/A	(1)	NA	Application rate is dependent on the soil type. Application of the EC formulations may be made alone or as a tank mix with other herbicides. The 80% DF formulation may also be applied to soybeans grown under reduced or conservation tillage conditions.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Soybeans (continued)					
Soil incorporated treatment Fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.25 lb/A	(1)	NA	Use limited to AL, AR, northern FL, GA, LA, MS, southeastern MO (Bootheel), NC, OK, SC, TN, and TX. Application rate is dependent on the soil type.
Soil incorporated treatment Fall Ground or aerial equipment	80% DF [62719-216]	1.5 lb/A	1	NA	Use limited to soybeans grown under reduced or conservation tillage conditions.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Soybeans (continued)					
Soil incorporated treatment Preplant Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.5 lb/A	(1)	NA	Use limited to LA for control of pigweed and seedling johnsongrass.
Soil incorporated treatment Preplant Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.5 lb/A	(1)	NA	Use limited to TX Gulf Coast Counties.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Soybeans (continued)					
Soil incorporated treatment (directed spray) Preplant Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-241]	1.5 lb/A	(1)	NA	Application rate is dependent on the soil type.
Soil incorporated treatment (directed spray) Layby Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-241]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.
Soil incorporated treatment Preplant Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1.5 lb/A	(1)	NA	Use limited to charcoal soils in AR, LA, and MS. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Soybeans (continued)					
Soil incorporated treatment Spring (preplant) Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(2)	NS	Use limited to AR, LA, MS, and TX for control of red rice. Two year treatment program which consists of a double rate application the first year followed by a single rate application the second. Application rate is dependent on the soil type.
Soil incorporated treatment Spring (preplant) or fall Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A or 1 lb/A	(2) or (4)	NS	Use limited to eastern U.S. and TX for control of rhizome johnsongrass. Two year treatment program which consists of either a double rate application or split applications (spring and fall) made at a single rate application for two consecutive years. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Soybeans (continued)					
Soil incorporated treatment Fall Ground or aerial equipment	80% DF [62719-216]	2 lb/A	(1)	NA	Use limited to AR, LA, and MS.
Soil incorporated treatment Preplant Ground equipment	3.4 lb/gal EC [62719-222]	0.96 lb/A	(1)	NA	A 85-day PHI has been established. A maximum seasonal rate of 0.96 lb ai/A is in effect. Application may be made alone or as a tank mix with other herbicides. Application rate is dependent on the soil type.Grazing or feeding treated soybean forage, hay, or straw to livestock is prohibited.
Spearmint (established)					
Soil incorporated treatment Dormant Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] 5 lb/gal EC [33660-31]	0.75 lb/A	(1)	NA	Use limited to ID, OR, and WA. Application rate is dependent on the soil type.
Squash, summer (see "Cucurbit vegetables.")					

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Stone fruits (including apricots, nectarines, peaches, plums, and prunes)					
Soil incorporated treatment Preplant (new plantings) Ground or aerial equipment	10% G [62719-131] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Stone fruits (including apricots, nectarines, peaches, plums, and prunes) (continued)					
Soil incorporated treatment (directed spray) Bearing and nonbearing established plantings Ground or aerial equipment	10% G [62719-131] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Application rate is dependent on the soil type.
Soil incorporated treatment Bearing and nonbearing established plantings Subsurface injection equipment	4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Use limited to CA.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Sugar beets					
Soil incorporated treatment (over-the-top spray) Postemergence Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Sugarcane					
Soil incorporated treatment Fall (postplant) and spring (preemergence or postemergence) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	2	NS	

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Sugarcane (continued)					
Broadcast surface application Postplant (plant cane) or postharvest (ratoon cane) Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	4 lb/A	(1)	NA	Use limited to HI.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Sugarcane (continued)					
Soil incorporated treatment Spring (preemergence or postemergence until layby) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Use limited to LA and TX.

(continued; footnotes follow.)

TABLE A *(continued)*.

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Sunflower					
Soil incorporated treatment Spring (preplant) or fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type. Application of the DF and EC formulations may be made alone or as a tank mix with other herbicides.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Tomatoes					
Soil incorporated treatment (directed spray) Postemergence (at blocking or thinning) or pretransplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.
Soil incorporated treatment Pretransplant Ground equipment	4 lb/gal EC [33660-32] [33660-33] [62719-97] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Tree nuts (including almonds, pecans, and walnuts)					
Soil incorporated treatment Preplant (new plantings) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-33] [62719-118]	1 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Tree nuts (including almonds, pecans, and walnuts) (continued)					
Soil incorporated treatment (directed spray) Bearing and nonbearing established plantings Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Tree nuts (including almonds, pecans, and walnuts) (continued)					
Soil incorporated treatment Bearing and nonbearing established plantings Subsurface injection equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	2 lb/A	(1)	NA	Use limited to CA.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Turnip greens (for processing)					
Soil incorporated treatment Preplant Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-97] [62719-116] [62719-241] [66222-13] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	Application rate is dependent on the soil type. The 4 lb/gal EC (EPA Reg. No. 62719-97) formulation may be applied using ground equipment only.
Walnuts ("See Tree nuts.")					
Watermelon (See also "Cucurbit vegetables.")					
Soil incorporated treatment (directed spray) Postemergence Ground equipment	4 lb/gal EC [MS81001900]	0.75 lb/A	(1)	NA	Use limited to MS. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Wheat					
Soil incorporated treatment Fall Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216]	0.75 lb/A	(1)	NA	For use on spring seeded or durum wheat.
Soil incorporated treatment Preplant (up to 3 weeks prior to planting or immediately before planting) Ground or aerial equipment	80% DF [62719-216]	0.75 lb/A	(1)	NA	Use limited to CO, KS, NE, and WY on winter wheat. Application rate is dependent on the soil type.
Soil incorporated treatment Preplant (up to 3 weeks prior to planting or immediately before planting) Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] [66222-13] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Use limited to ID, MT, OR, and WA on winter wheat. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Wheat (continued)					
Soil incorporated treatment Preplant (up to 3 weeks prior to planting or to fallow soil up to 4 months before planting) Ground or aerial equipment	10% G [62719-131] 80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	1 lb/A	(1)	NA	Use limited to ID, OR, and WA on winter wheat. Application rate is dependent on the soil type.
Soil incorporated treatment Preplant (to fallow soil up to 4 months before planting) Ground or aerial equipment	4 lb/gal EC [33660-32] [33660-33] [66222-13] 5 lb/gal EC [33660-31]	1 lb/A	(1)	NA	Use limited OR and WA on winter wheat. Application rate is dependent on the soil type.

(continued; footnotes follow.)

TABLE A (*continued*).

Site Application Type Application Timing Application Equipment	Form [EPA Reg. No.]	Max. Single Application Rate (ai)	Max. # Apps.	Min. Retreatment Interval (Days)	Use Limitations [a,b]
Wheat (continued)					
Soil incorporated treatment Postplant, preemergence Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [62719-93] [62719-116] [62719-241] 5 lb/gal EC [62719-118]	0.75 lb/A	(1)	NA	Use limited to ID, OR, and WA on winter wheat. Application rate is dependent on the soil type.
Soil incorporated treatment Postplant, preemergence Ground or aerial equipment	80% DF [62719-216] 4 lb/gal EC [33660-32] [33660-33] [62719-93] [62719-116] [62719-241] 5 lb/gal EC [33660-31] [62719-118]	0.75 lb/A	(1)	NA	For use on spring seeded or durum wheat. Application rate is dependent on the soil type. Application may be made alone or as a tank mix with other herbicides.
Soil incorporated treatment Summer fallow period Ground or aerial equipment	10% G [62719-131]	0.5-1 lb/A	(1)	NA	For use on spring seeded or durum wheat. Application rate is dependent on application date.

(continued; footnotes follow.)

[a] A 12-hour restricted entry interval (REI) has been established.

[b] The following rotational crop restrictions have been established for the 10% G (EPA Reg. No. 62719-131), 80% DF (EPA Reg. No. 62719-216), and the 4 and 5 lb/gal EC (EPA Reg. Nos. 62719-93, 62719-116, 62719-118, and 62719-241) formulations: (i) for sugar beets, red beets, and spinach grown in AZ, CA, CO, ID, NV, NM, OR, UT, WA, and WY a 12-month plant-back interval (PBI) after spring application or 14-month PBI after fall application; if land has not been irrigated, an 18-month PBI after spring application or 20-month PBI; in other areas, sugar beets, red beets, and spinach may be planted 12 months after spring application or 14 months after fall application; (ii) for corn, oats, proso millet, sorghum (milo), and annual/perennial crops or grass mixtures grown in AZ, CA, CO, ID, NV, NM, OR, UT, WA, and WY a 12-month PBI after spring application or 14-month PBI after fall application; if land has not been irrigated, an 18-month PBI after spring application or 20-month PBI after fall application; for oats, proso millet, sorghum (milo), and annual/perennial crops or grass mixtures grown in MN, ND, and SD an 18-month PBI after spring application or 21-month PBI after fall application; for oats, proso millet, sorghum (milo), and annual/perennial grass crops or grass mixtures grown in KS, NE, OK, and TX in areas that receive <20 inches of rainfall or irrigation an 18-month PBI and in areas that receive >20 inches of rainfall or irrigation a 12-month PBI after spring application or 14-month PBI after fall application; (iii) for vegetable crops other than those listed on the label for use with preplant soil incorporated treatment a 5-PBI.

The following rotational crop restrictions have been established for the 4 and 5 lb/gal EC (EPA Reg. Nos. 33660-31, 33660-32, and 33660-33) formulations: (i) for sugar beets, red beets, and spinach grown in AZ, CA, CO, ID, NV, NM, OR, UT, WA, and WY a 12-month PBI after spring application or 14-month PBI after fall application; (ii) for corn, oats, and sorghum (milo) a 14-month PBI after spring application or 16-month PBI after fall application; if land has not been irrigated, an 18-month PBI after spring application or 20-month PBI after fall application; for oats and sorghum (milo) grown in KS, NE, ND, OK, SD, and TX in areas that receive >25 inches of rainfall or irrigation a 12-month PBI or in areas that receive <25 inches of rainfall or irrigation an 18-month PBI; (iii) for vegetable crops other than those listed on the label grown in FL a 5-PBI.

The following rotational crop restrictions have been established for the 4 lb/gal EC (EPA Reg. No. 66222-13) formulation: (i) for sugar beets, red beets, and spinach grown in AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, and WY a 12-month PBI after spring application or 14-month PBI after fall application; (ii) for corn, oats (proso millet), and sorghum (milo) a 14-month PBI after spring application or 16-month PBI after fall application; if land has not been irrigated, an 18-month PBI after spring application or 20-month PBI after fall application; (iii) for vegetable crops other than those listed on the label grown in FL a 5-PBI.

The following rotational crop restrictions have been established for the 3.4 lb/gal EC (EPA Reg. No. 62719-222) formulation: (i) for alfalfa, barley, dry beans, peanuts, peas, and wheat a 4-month PBI; (ii) for rice grown in AZ, CA, CO, ID, MN, MT, ND, NM, NV, OR, UT, SD, WA, and WY a 4-month PBI and in other states a 6-month PBI; (iii) for rye grown in AZ, CA, CO, ID, MN, MT, ND, NM, NV, OR, UT, SD, WA, and WY a 6-month PBI and in other states a 4-month PBI; (iv) for corn grown in MN, ND, and SD a 12-month PBI, grown in AZ, CA, CO, ID, MT, NM, NV, OR, UT, WA, and WY an 18-month PBI, and in other states an 8-month PBI; (v) for oats, proso millet, annual/perennial grass crops or grass mixtures grown in AZ, CA, CO, ID, MN, MT, ND, NM, NV, OR, UT, SD, WA, and WY an 18-month PBI and in other states a 12-month PBI; (vi) for sorghum grain and sunflower an 18-month PBI; (vii) for cotton a 22 month PBI; (viii) for sugar beets and rapeseed (canola) a 26-month PBI; and (ix) for other crops not listed a 26-month PBI and a successful field bioassay.

No rotation crop restrictions have been established for the 4 lb/gal EC (EPA Reg. Nos. 62719-97) formulation.

TABLE B. RESIDUE CHEMISTRY SCIENCE ASSESSMENTS FOR REREGISTRATION OF TRIFLURALIN.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
171-3: Directions for use	NA = Not Applicable	No	See Table A
171-4 (a): Plant Metabolism	NA	No	00024731, 00026054, 00093553, 00105720, 00105759, 00124905, 00125299, 41179001 [2], 41179002 [2], 41396801 [3], 41396802 [3]
171-4 (b): Animal Metabolism	NA	No	00093636, 00105690, 00105772, 41233101 [4,5], 41233102 [4], 41286101 [5]
171-4 (c/d): Residue Analytical Methods	NA	No [6]	00022793, 00047591, 00047639, 00059532, 00067371, 00067435, 00080320, 00105646, 00105689, 00105695, 00105720, 00105759, 00125303
171-4 (e): Storage Stability	NA	Yes [7]	00047639, 00105716, 00105720, **41335901**
171-4 (k): Magnitude of the Residue in Plants			
Root and Tuber Vegetables Group	0.05 [8] vegetables, root (exc. carrot) [180.207]	No	
- Carrots	1.0 [180.207]	No	00033087, 00093554
- Chicory, Roots	--	No	
- Potatoes	--	No	00022257, 00093574, 00105733, 00105734, 00133939
- Radishes, Roots	--	No	42430802 [9]
- Sugar Beets, Roots	--	No	00057546, 00105648, 00105666, 00105757

(continued; footnotes follow.)

TABLE B *(continued)*.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Turnips, Roots	--	No	
Leaves of Root and Tuber Vegetables Group	0.05 [10], vegetables, leafy [180.207]	No	
- Chicory, Tops	--	No	
- Radishes, Tops	--	No [11]	
- Sugar Beets, Tops	--	No	00057546, 00105648, 00105666, 00105757
- Turnips, Tops	--	No	00105724
Bulb Vegetables Group	0.05 [12] vegetables, root (exc. carrots) [180.207]	No	
- Garlic	--	No	00105678
- Onions, Dry Bulb	--	No	00120263
- Onions, Green	--	No	42448202 [13]
Leafy Vegetables Group (except Brassica Vegetables)	0.05 [14] vegetables, leafy [180.207]	No	
- Celery	--	No	00093549, 00105670
- Endive	--	No	
- Upland Cress	0.05 [180.207]	No [15]	
Brassica (Cole) Leafy Vegetables Group	0.05 [16] vegetables, leafy [180.207]	No	
- Broccoli	--	No	00105650, 00105749
- Brussels Sprouts	--	No	00105749

(continued; footnotes follow.)

TABLE B *(continued)*.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Cabbage	--	No	00105749, 00105650
- Cauliflower	--	No	00105749
- Collards	--	No	00105724
- Kale	--	No	00105724
- Mustard Greens	--	No	00105724
- Rape Greens	--	No [17]	
Legume Vegetables (Dry or Succulent) Group	0.05 [18] vegetables, seed and pod [§180.207]	No	
- Adzuki Beans	--	No	
- Beans, Dry	--	No	00022376, 00105669, 00105726
- Field, Peas (Cowpeas, Black-Eyed Peas)	--	No	00105669
- Guar Beans	--	No	00105670
- Lima Beans	--	No	00033086, 00105669, 00105726
- Mung Beans	2.0, beans, mung, sprouts [§180.207]	No [19]	00105670
- Peas (Succulent and Dried)	--	No	00105669, 00105755
- Snap Beans	--	No	00022376, 00033086, 00057547, 00105669

(continued; footnotes follow.)

TABLE B *(continued)*.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Soybeans and aspirated grain fractions	--	No [20]	00022793, 00030932, 00067433, 00094410, 00096361, 00104423, 00105655, 00105669, 00105717, 00105720, 00105725, 00105746, 00124904, 00128308
Foliage of Legume Vegetables Group	0.05 [21] legumes, forage [§180.207]	No	
- Beans, Forage and Straw/Hay	--	No	00022376, 00105669
- Peas, Vines and Hay	--	No	00105669
- Soybeans, Forage, and Hay	--	No	00022793, 00030932, 00067433, 00096361, 00105720
Fruiting Vegetables (Except Cucurbits) Group	0.05, vegetables, fruiting [§180.207]	No	
- Peppers	--	No	00105750
- Tomatoes	--	No	00105710, 00105726 00105750
Cucurbit Vegetables Group	0.05, cucurbits [§180.207]	No	
- Cantaloupes	--	No	00093555, 00105726
- Cucumbers	--	No	00093555
- Squash, Summer	--	No	42354502 [22]
- Watermelons	--	No	00105670
Citrus Fruits Group	0.05, citrus fruits [§180.207]	No	
- Grapefruit	--	No	00105677

(continued; footnotes follow.)

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TABLE B *(continued)*.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Lemons	--	No	00105677
- Oranges	--	No	00105677
- Tangelos	--	No	00105677
- Tangerines	--	No	00105677
Stone Fruits Group	0.05, stone fruits [§180.207]	No	
- Apricots	--	No	00105667, 00105675
- Cherries	--	No	42430803 [9]
- Nectarines	--	No	
- Peaches	--	No	00105667, 00105675
- Plums	--	No	00105675, 00105735
Small Fruits and Berries Group			
- Grapes	0.05 [§180.207]	No	00105678
Tree Nuts Group	0.05 [23] nuts [§180.207]	No	
- Almonds, Nutmeat and Hulls	--	No	00105675, 00105726
- Pecans	--	No	00105675
- Walnuts	--	No	00105675
Cereal Grains Group	0.05 [24] grain crops (except fresh corn and rice grain) [§180.207]		
- Barley, Grain	--	No	00070736, 00105704

(continued; footnotes follow.)

TABLE B *(continued)*.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Corn, Field, Grain and aspirated grain fractions	0.05, corn grain (except popcorn) [§180.207]	No [25]	00032811, 00105697, 00105726, 42448201[13], 42779001 [26]
- Sorghum, Grain and aspirated grain fractions	--	No [27]	00105704, 00105726
- Wheat, Grain and aspirated grain fractions	0.05 [§180.207]	No [28]	00070736, 00105681, 00105726
Forage, Fodder, and Straw of Cereal Grains Group			
- Barley Forage, Hay, and Straw	0.05 [29] barley forage, fodder, hay, and straw [§180.207]	No	00070736, 00105704
- Corn, Field, Forage and Fodder	0.05 corn, grain (exc. popcorn), forage and fodder [§180.207]	Yes [30]	00032811, 00105726, 42472301 [31]
- Sorghum Forage and Fodder	0.05 sorghum fodder and forage [§180.207]	No [32]	00105704
- Wheat Forage, Hay, and Straw	0.05 [33] wheat straw [§180.207]	No	00070736, 00105681
Non-grass Animal Feeds Group			
- Alfalfa, Forage and Hay	0.2, alfalfa, hay; and 0.05 [34], legumes, forage [180.207]	Yes [35]	00093637, 00105691, 00105726, **00143667**, **00155395**, 42460001-42460010 [31]
Miscellaneous Commodities			
- Asparagus	0.05 [§180.207]	No	00105696, 00105702
- Cotton, Seed and Gin Byproducts	0.05, cottonseed [§180.207]	Yes [36]	00093190, 00105669, 00105713, 00105726, 00105729, 00105731, 00105751, 00105759, 00105780, 00105781, 00124904

(continued; footnotes follow.)

TABLE B *(continued)*.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Flax, Seed and Straw	0.05 flax seed and straw [§180.207]	Yes [37]	00084581
- Hops, Cones, Dried	0.05 [§180.207]	No	00105678
- Mustard Seed	--	No [38]	00067371, 42430801 [9]
- Okra	0.05 [39] vegetables, seed and pod [§180.207]	No	00105669
- Peanuts, Nutmeat, Hay, and Hulls	0.05, peanuts; 0.1, peanut hulls [§180.207]	No [40]	00026049, 00059531, 00067222, 00105646, 42472302 [31]
- Peppermint, Tops	0.05 peppermint hay [§180.207]	No	00105683
- Rape, Seed and Forage	0.05 [41] rape seed and straw [§180.207]	No [42]	00047639
- Safflower, Seed and Forage	0.05 safflower seed [§180.207]	No [43]	00067371, 00105726, 00105750
- Spearmint, Tops	0.05 spearmint hay [§180.207]	No	00105683
- Sugarcane	0.05 [§180.207]	No [44]	00105668, 00105674, 00105727, 00105730
- Sunflower Seed and Forage	0.05 sunflower seed [§180.207]	Yes [45]	00057545, 00067371, 00067430, 00105673
171-4(l), Magnitude of the Residues in Processed Food/Feed			
- Alfalfa	--	No [46]	
- Barley	--	No [47]	
- Beans	--	No [48]	
- Corn, Field	--	No	42403201 [49], 42917801 [50]
- Cottonseed	--	No	42354501 [22],[51]
- Flax		No [52]	
- Grapes	--	No	00105678

(continued; footnotes follow.)

TABLE B *(continued)*.

GLN: Data Requirements	Current Tolerances, ppm [40 CFR]	Must Additional Data Be Submitted?	References [1]
- Hops	--	No [53]	00105678
- Citrus	--	No	42642601 [54]
- Peanuts	--	No	42430804 [9], 42779001 [26]
- Peppermint	2.0, peppermint oil [§185.5900]	Yes [55]	
- Plums	--	No	00105675, 00105735
- Potato	--	No [56]	42514501 [57]
- Rape seed	--	No [58]	
- Safflower seed	--	No [59]	
- Sorghum, grain	--	No	42325001 [60]
- Soybeans	--	No	42448203 [13], 42779001 [26]
- Spearmint	2.0, spearmint oil [§185.5900]	Yes [61]	
- Sugar beets	--	No	42448204 [13]
- Sugarcane	--	No	**41306701**
- Sunflower seed	--	No	42430805 [9]
- Tomatoes	--	No	00105710, 00105726 00105750
- Wheat	--	No	42430806 [9], 42779001 [26]
171-4 (j): Magnitude of the Residue in Meat, Milk, Poultry, and Eggs	--	Waived [62]	0023105, 00080320, 00080322, 00093634, 00093636, 00105772
165-1: Rotational Crops (Confined)	--	Reserved	41661102 [63]
165-2: Rotational Crops (Field)	--	Reserved	

1. **Bolded** references were reviewed in the Trifluralin Residue Chemistry Reregistration Standard Update of 10/29/91. Unbolded references were reviewed in the Residue Chemistry Science Chapter of the Reregistration Standard dated 7/12/85. Otherwise, references were reviewed as noted.

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2. CBRS No. 5644, 10/6/89, E. Haeberer.

3. CBRS No. 6432, 3/16/90, E. Haeberer.

4. CBRS No. 5927, 11/14/89, R. Schmitt.

5. CBRS No. 6568, E. Haeberer, 4/16/90.

6. According to a Greybeard committee decision made on 2/2/94, the requirement for residue analytical methods suitable for data collection and tolerance enforcement for the determination of trifluralin in animal commodities has been waived.

7. Information concerning sample storage intervals and conditions for numerous magnitude of the residue studies previously submitted and reviewed in the Trifluralin Registration Standard (7/12/85) remains outstanding. The Agency has recently provided clarification of this requirement to the registrant by specifying which magnitude of the residue studies need additional sample storage information (CBRS No. None, DP Barcode No. D207243, 9/14/94, B. Cropp-Kohlligian). This information is considered confirmatory but is important to tolerance reassessment and would increase our confidence with respect to risk assessment.

8. The now-obsolete "root vegetables (exc. carrots)" group tolerance should be revoked concomitant with the establishment of a crop group tolerance for root and tuber vegetables (exc. carrots). Based on available data for potatoes, radish roots, and sugar beet roots, a tolerance of 0.05 ppm would be appropriate.

9. CBRS No. 10548, DP Barcode D182363, 2/1/93, D. Miller.

10. The now obsolete "leafy vegetables" group tolerance should be revoked concomitant with the establishment of a crop group tolerance for leaves of root and tuber vegetables. Based on the available data for representative members of this crop group, a tolerance of 0.05 ppm would be appropriate.

11. The Agency currently recognizes radish tops as a raw agricultural commodity (TABLE II (June 1994)). Radish top data are not required to support a leaves of root and tuber crop group tolerance.

12. The now obsolete "vegetables, root (exc. carrot)" group tolerance should be revoked concomitant with the establishment of a crop group tolerance for bulb vegetables. Based on the available data for representative members of this crop group, a tolerance of 0.05 ppm would be appropriate.

13. CBRS No. 10541, DP Barcode D182371, 2/1/93, D. Miller.

14. A crop group tolerance for leafy vegetables (except Brassica vegetables) group is inappropriate because trifluralin residue data have not been submitted for representative commodities (i.e., lettuce (head and leaf) and spinach) and because trifluralin is not currently registered for use on the representative commodities of the leafy vegetables (except Brassica vegetables) crop group. Therefore, the now obsolete "leafy vegetables" crop group tolerance should be revoked concomitant with the establishment of individual tolerances for celery and endive. Based on the available celery data, which will be translated to endive, tolerances of 0.05 ppm would be appropriate for celery and endive.

15. There are no registered uses of trifluralin on upland cress and no residue data for use on upland cress have been submitted. The established tolerance for upland cress should be revoked.

16. The now obsolete "leafy vegetables" group tolerance should be revoked concomitant with the establishment of a crop group tolerance for Brassica (cole) leafy vegetables. Based on the available data for representative members of this crop group, a tolerance of 0.05 ppm would be appropriate.

17. The Agency currently recognizes rape greens as a raw agricultural commodity (TABLE II (June 1994)). Rape green data are not required to support a Brassica (cole) leafy vegetables crop group tolerance.

18. The now obsolete "seed and pod vegetables" group tolerance should be revoked concomitant with the establishment of a crop group tolerance for legume vegetables (succulent/dried). Based on the available data for representative members of this crop group, a tolerance of 0.05 ppm would be appropriate.

19. The Agency currently recognizes bean sprouts as a raw agricultural commodity (TABLE II (June 1994)), however, since there are no registered uses of trifluralin on mung bean sprouts *per se*, the 2 ppm tolerance should be revoked.

20. The Agency currently recognizes aspirated grain fractions as a raw agricultural commodity of soybeans (TABLE II (June 1994)). Available data (MRID 42448203) adequately demonstrate that residues of trifluralin do not concentrate in aspirated grain fractions and, therefore, no tolerance for residues in/on aspirated grain fractions of soybeans is required.

21. The now obsolete "forage legumes" group tolerance should be revoked concomitant with the establishment of a crop group tolerance for foliage of legume vegetables. Based on the available data for representative members of this crop group (bean forage and hay, pea vines, and soybean forage and hay), a tolerance of 0.05 ppm would be appropriate.

22. CBRS No. 10143, DP Barcode D179897, 9/29/92, B. Cropp-Kohlligian.

23. The now obsolete "nuts" group commodity definition should be replaced with the more appropriate definition, "tree nuts" group. A separate tolerance of 0.05 ppm should be proposed for residues of trifluralin in/on almond hulls.

24. The established crop group tolerance of 0.05 ppm in/on "grain crops (except corn and rice grain)" is inappropriate because there are no residue data or registered uses for rice and sweet corn, representative commodities of this group. Furthermore, the use directions are not uniform for the other representative commodities of this group. Therefore, the established crop group tolerance for "grain crops (except corn and rice grain)" should be revoked concomitant with the establishment of individual tolerances, each at 0.05 ppm, for barley grain and sorghum grain. Separate adequate tolerances of 0.05 ppm already exist for field corn and wheat grain. The available data for field corn grain will be translated to sorghum grain.

25. The Agency currently recognizes aspirated grain fractions as a raw agricultural commodity of field corn (TABLE II (June 1994)). Available grain dust data (MRIDs 42403201 and 42917801) adequately demonstrate that residues of trifluralin do not concentrate in aspirated grain fractions, and, therefore, no tolerance for residues of trifluralin in/on aspirated grain fractions of field corn is needed.

26. CBRS No. 12007, DP Barcode D192062, 11/3/93, B. Cropp-Kohlligian.

27. The Agency currently recognizes aspirated grain fractions as a raw agricultural commodity of sorghum grain (TABLE II (June 1994)). Although no sorghum aspirated grain fraction data have been submitted, the Agency has determined that residues of trifluralin are not likely to concentrate on the surface of sorghum grain since trifluralin is applied early in the growing season (CBRS No. 9991, DP Barcode D179068, 9/28/92, B. Cropp-Kohlligian). Therefore, residue data and a tolerance are not required for the aspirated grain fractions of sorghum grain.

28. The Agency currently recognizes aspirated grain fractions as a raw agricultural commodity of wheat grain (TABLE II (June 1994)). Available wheat grain dust data (MRIDs 42430806 and 42779001) adequately demonstrate that residues of trifluralin do not concentrate in aspirated grain fractions and, therefore, no tolerance for residues of trifluralin in/on aspirated grain fractions of wheat is required.

29. The established 0.05 ppm tolerance for barley forage is supported by adequate residue data. Available data on barley straw treated at the maximum registered application rate indicate that the established barley straw tolerance will be exceeded. No data concerning trifluralin residues in/on barley hay are available. Based on the available data for barley and wheat straw, the established tolerances for barley hay and straw should be increased to 0.1 ppm. The Agency no longer recognizes barley fodder as a raw agricultural commodity of barley (TABLE II (June 1994)) and the established tolerance for barley fodder should be revoked.

30. The residue study (MRID 42472301) on corn forage, fodder, and silage is adequate pending submission of acceptable data validating the analytical method (Method No. GRM92.11) at or below the established 0.05 ppm tolerance level. The registrant must amend product labels to limit applications to clearly recognizable growth stages which assure at least a 6-week interval prior to harvesting forage and fodder.

31. CBRS No. 10673, DP Barcode D183215, 9/23/93, D. Miller.

32. Field corn forage and fodder data will be translated to sorghum forage and fodder.

33. The available data for wheat and barley straw, considered together, indicate that a tolerance of 0.1 ppm is appropriate for wheat straw. Tolerances for wheat forage and hay need to be established. The available data for wheat forage indicate that a tolerance of 0.05 would be appropriate for wheat forage. No data concerning trifluralin residues in/on wheat hay are available. The available barley and wheat straw data indicate that a tolerance of 0.1 ppm would be appropriate for wheat hay.

34. The now obsolete "forage legumes" group tolerance should be revoked concomitant with the establishment of a tolerance for alfalfa forage.

35. The registrant has proposed a large increase in the maximum application rate to alfalfa (two treatments at 2 lb ai/A with a 14-day PHI) and correspondingly has requested large increases in the tolerance levels for alfalfa forage and alfalfa hay (1 ppm and 3 ppm, respectively). The field trial studies submitted in support of the increased rates on alfalfa forage and hay were deemed inadequate because geographic representation was insufficient and storage temperatures were not reported. Additional field trials are required. Although incomplete, the available data indicate that trifluralin residues in/on alfalfa forage and hay are likely to exceed the established tolerances for legume forage (0.05 ppm) and alfalfa hay (0.2 ppm) following application of trifluralin at the proposed maximum application rate. Once the requested alfalfa data have been submitted, the registrant must propose a tolerance for alfalfa forage and a revised tolerance level for alfalfa hay.

    The data on alfalfa seed are adequate and no additional data are required. Currently the registered uses of alfalfa grown for seed are considered nonfood uses because the labels prohibit the use of any portion of the treated field, including seed, seed screenings, hay, forage, or stubble, for human or animal consumption.

36. The Agency currently recognizes cotton gin byproducts (commonly called gin trash) as a raw agricultural commodity of cotton (TABLE II (June 1994)). Data are hereby required depicting residues of trifluralin in/on cotton gin byproducts resulting from the maximum registered use of trifluralin to cotton. A minimum of six (6) field trials are required. For additional guidance on sampling and geographical locations for field trials the registrant should consult, "EPA Guidance on Number and Location of Domestic Crop Field Trials for Establishment of Pesticide Residue Tolerances" issued 6/2/94.

The Agency no longer recognizes cotton forage as a raw agricultural commodity of cotton (TABLE II (June 1994)). No cotton forage data are required.

37. The residue data requirement for flax straw, as specified in the Trifluralin Update dated 10/29/91, remains outstanding. CBRS has recommended that field trials be conducted according to the maximum registered use patterns in ND and/or SD.

38. An acceptable study has been submitted to support the use of trifluralin on mustard grown for seed. The registrant should propose a tolerance for mustard seed. The available data indicate that a tolerance of 0.01 ppm is appropriate for mustard seed.

39. The now obsolete "seed and pod vegetables" group tolerance should be revoked concomitant with the establishment of a separate tolerance for okra. Based on the available data, a tolerance of 0.05 ppm would be appropriate.

40. The Agency no longer recognizes peanut vines as a raw agricultural commodity of peanuts nor does the Agency consider peanut hay to be under the control of growers/farmers (TABLE II (June 1994)). A tolerance for peanut hay must be established. Based on the available data, a tolerance of 0.05 ppm would be appropriate.

41. The Agency no longer recognizes rape straw as a raw agricultural commodity of rape (TABLE II (June 1994)). Therefore, the established tolerance for rape straw should be revoked.

42. The Agency currently recognizes rape forage as a raw agricultural commodity of rape which is not under grower/farmer control (TABLE II (June 1994)). Therefore, a tolerance for rape forage needs to be established. The required data for sunflower forage will translated to rape forage.

43. The Agency currently recognizes safflower forage as a raw agricultural commodity of safflower which is not under grower/farmer control (TABLE II (June)). Therefore, a tolerance for safflower forage needs to be established. The required data for sunflower forage will be translated to safflower forage.

44. The Agency no longer recognizes sugarcane forage as a raw agricultural commodity of sugarcane (TABLE II (June 1994)). Therefore, no sugarcane forage residue data are required.

45. The residue data requirement for sunflower forage, as specified in the Trifluralin Update dated 10/29/91, remains outstanding. CBRS has recommended the number and location of the proposed field trials to generate the required data for sunflower forage. The registrant must propose a tolerance for sunflower forage once adequate data have been submitted and evaluated.

46. The Agency does not recognize any processed commodities for alfalfa (TABLE II (June 1994)). Residue data are not required for alfalfa meal and residue data on alfalfa silage are optional. No alfalfa processing data are required.

47. Available wheat processing data have been translated to barley processed commodities. Based on the available wheat processing data (MRIDs 42430806 and 42779001), residues of trifluralin are not expected to concentrate in the processed commodities of barley. No additional barley processing data are required. No tolerances are needed for residues of trifluralin in/on the processed commodities of barley.

48. The Agency no longer recognizes cannery waste as a processed commodity of beans (TABLE II (June 1994)). No bean processing data are required.

49. CBRS No. 10338, DP Barcode D181183, 2/8/93, B. Cropp-Kohlligian.

50. CBRS No. 12616, DP Barcode D195423, 10/28/93, B. Cropp-Kohlligian.

51. CBRS No. 11298, DP Barcode D187478, 3/29/93, B. Cropp-Kohlligian.

52. Cottonseed processing data have been translated to flax processed commodities. No tolerances are required the processed commodities of flax.

53. Since residues of trifluralin were non-detectable (<0.01 ppm) in/on fresh hops following applications at exaggerated rates, residue data for dried hops and spent hops are not required.

54. CBRS No. 11430, DP Barcode D188347, 4/1/93, D. Miller.

55. The requirement for a peppermint processing study, as specified in the Trifluralin Update dated 10/29/91, remains outstanding.

56. Potato processing data (MRID 42514501) have previously been reviewed by the Agency (CBRS No. 10781, DP Barcode 183828, 5/6/93, A. Aikens) and deemed adequate to satisfy data requirements. These data demonstrate that residues of trifluralin do not concentrate in flakes and chips but do concentrate in wet peel (5x) and dried peel (280x). [Note: Concentration factor demonstrated by potato dry peel data exceed the maximum theoretical concentration factor for potatoes estimated by the data reviewer at 50x.] Based on the submitted potato processing study, the Agency recommended that a feed additive tolerance for residues of trifluralin in processed potato waste should be established using the maximum theoretical concentration of residues in dry peel. However, since that time, the Agency has Updated the Livestock Feeds Table for Subdivision O (TABLE II (June 1994)) and now establishes feed additive tolerances for processed potato waste based on the maximum concentration factor observed for residues in/on wet peel. Because the potato processing study was conducted at exaggerated application rates (up to 5x) resulting in trifluralin residue levels in/on processed wet potato peel samples (ranging from <0.05 ppm to 0.05 ppm) equal to or below the currently established tolerance for potatoes (0.05 ppm), the Agency hereby concludes that a feed additive tolerance for residues of trifluralin in/on processed potato waste is not required. The currently established tolerance for residues in/on potatoes will apply to processed potato waste.

57. CBRS No. 10781, DP Barcode D183828, 5/6/93, A. Aikens.

58. A rape seed processing study is not available. The available sunflower processing data have been translated to rape seed.

59. A safflower seed processing study is not available. The available sunflower processing data have been translated to safflower seed.

60. CBRS No. 9991, DP Barcode D179068, 9/28/92, B. Cropp-Kohlligian.

61. The requirement for a spearmint processing study, as specified in the Trifluralin Update dated 10/29/91, remains outstanding.

62. The data requirements for magnitude of trifluralin residue in meat, milk, poultry, and eggs have been waived based on the low levels of radioactive residues from the animal metabolism studies (CBRS No. None, DP Barcode None, 2/4/93, R. Perfetti). This is considered to be a 40 CFR §180.6 category 3 with respect to the need for tolerances for trifluralin residues in meat, milk, poultry and eggs.

63. Data pertaining to this topic are currently under review.

DIETARY EXPOSURE ASSESSMENT SUMMARY

Plant metabolism data for trifluralin are adequate. Except for alfalfa forage, alfalfa hay, flax straw, and sunflower forage, the field trial data are adequate. The residue study on corn forage, fodder, and silage is adequate pending submission of acceptable data validating the analytical method (Method No. GRM92.11) at or below the established 0.05 ppm tolerance level. Adequate processing studies have been submitted for field corn, cottonseed, grapes, hops, citrus, peanuts, plums, potatoes, sorghum grain, soybeans, sugar beets, sugarcane, sunflower seed, tomatoes, and wheat. Based on these data residues of trifluralin are not expected to concentrate in the processed commodities of barley, field corn, cottonseed, flax, grapes, hops, citrus, peanuts, plums, potatoes, rape seed, safflower seed, sorghum grain, soybeans, sugar beets, sugarcane, sunflower seed, tomatoes, and wheat. Peppermint and spearmint processing data remain outstanding. Information concerning sample storage intervals and conditions for numerous magnitude of the residue studies previously submitted and reviewed in the Trifluralin Registration Standard (7/12/85) remain outstanding. Acceptable storage stability studies have been conducted on numerous commodities matrices. The existing data indicate that the established tolerances and/or the revised tolerance recommendations made in this report are supported.

The qualitative nature of the residue in animals is adequately understood. Based on available ruminant and poultry metabolism data, the Agency has concluded that there is no reasonable expectation of finite residues of trifluralin in animal commodities. Therefore, there is no need for tolerances for trifluralin residues in meat, milk, poultry and eggs.

The dietary exposure assessment for trifluralin will be based on tolerance level residues and proposed tolerance levels as indicated herein. Though confirmatory, receipt of the required sample storage information will increase our confidence with respect to risk assessment since the associate magnitude of the residue data comprise a substantial portion of the total magnitude of the residue data base available for risk assessment.

TOLERANCE REASSESSMENT SUMMARY

Tolerances Listed Under 40 CFR §180.207:

The tolerances listed in 40 CFR §180.207 are for the residues of trifluralin *per se*. A summary of trifluralin tolerance reassessments is presented in Table C.

The "(N)" designation should be deleted from all 40 CFR §180.207 entries.

Sufficient data are available to ascertain the adequacy of the established tolerances listed in 40 CFR §180.207 (as defined) for the following commodities: asparagus; barley forage; barley hay; barley straw; carrots; citrus fruits; corn grain (exc. popcorn); corn forage; corn fodder; cottonseed; cucurbits; flax seed; grapes; hops; nuts; peanut hulls; peanuts; peppermint, hay; rape seed; safflower seed; sorghum forage; sorghum fodder; spearmint, hay; stone fruits; sugarcane; sunflower seed; vegetables, fruiting; wheat, grain; and wheat, straw. See Table C for appropriate commodity definitions of some of these entries.

Available data for wheat straw and barley straw reflecting treatment at the maximum registered application rate indicate that the established tolerance for residues of trifluralin in/on wheat straw, barley straw, and barley hay should be increased to 0.1 ppm.

The established crop group tolerance for the obsolete "root vegetables (exc. carrots)" should be revoked concomitant with the establishment of: (i) a tolerance for root and tuber vegetables (exc, carrots) at 0.05 ppm; and (ii) a tolerance for bulb vegetables group at 0.05 ppm. The available data for radish roots and sugar beet roots will be translated to chicory roots and turnip roots.

The established crop group tolerance for the obsolete "leafy vegetables" should be revoked concomitant with the establishment of: (i) separate tolerances for celery and endive, each at 0.05 ppm; (ii) a tolerance for leaves of root and tuber vegetables group at 0.05 ppm; and (iii) a tolerance for Brassica (cole) leafy vegetables group at 0.05 ppm. The available data for celery will be translated to endive.

The established crop group tolerance for the obsolete "seed and pod vegetables" should be revoked concomitant with the establishment of: (i) a tolerance for legume vegetables (succulent/dried) group at 0.05 ppm; and (ii) a separate tolerance for okra at 0.05 ppm.

The established crop group tolerance of 0.05 ppm in/on "grain crops (except corn and rice grain)" is inappropriate because there are no registered uses for rice, a representative commodity of this group; furthermore, the use directions are not uniform for the representative commodities of this group. Therefore, the established crop group tolerance for "grain crops (except corn and rice grain)" should be revoked concomitant with the establishment of individual tolerances, each at 0.05 ppm, for barley grain and sorghum grain. Separate adequate tolerances of 0.05 ppm already exist for corn and wheat grain. The

available data for field corn grain will be translated to sorghum grain.

The established crop group tolerance for "forage legumes" should be revoked concomitant with the establishment of: (i) a tolerance for foliage of legume vegetables group at 0.05 ppm; and (ii) a separate tolerance for alfalfa forage at a level to be determined upon receipt of required magnitude of the residue data.

The established tolerance for mung bean sprouts should be revoked because no registered uses exist for mung bean sprouts *per se*.

The established tolerance for upland cress should be revoked because no registered uses exist.

The Agency no longer considers barley fodder and rape straw as raw agricultural commodities of barley and rape, respectively (TABLE II (June 1994)). The established tolerances for barley fodder and rape straw should be revoked.

Additional magnitude of the residue data are required before the established tolerances for alfalfa hay and flax straw can be assessed.

Tolerances That Need To Be Proposed Under 40 CFR §180.207:

Sufficient data are available to recommend for the establishment of a tolerance for residues of trifluralin at 0.05 ppm in/on the following raw agricultural commodities: almond hulls, barley grain, celery, okra, peanut hay, sorghum grain, and wheat forage.

Based on available celery data which have been translated to endive, a tolerance for the residues of trifluralin should be established in/on endive. A tolerance of 0.05 ppm would be appropriate.

Sufficient data on representative commodities are available to recommend for the establishment of the following crop group tolerances for residues of trifluralin at 0.05 ppm: Brassica (cole) leafy vegetables, bulb vegetables, foliage of legume vegetables, leaves of root and tuber vegetables, and legume vegetables (dry and succulent).

Sufficient mustard seed data are available to recommend for the establishment of a tolerance for residues of trifluralin at 0.01 ppm in/on mustard seed.

A tolerances for residues of trifluralin in/on wheat hay must be established. Based on available barley straw and wheat straw data, a tolerance of 0.1 ppm would be appropriate.

The registrant must also propose tolerances for alfalfa forage and sunflower forage once adequate data have been submitted and evaluated.

The Agency currently recognizes cotton gin by products as a raw agricultural commodity of cotton and has determined that label restrictions for rape forage and safflower forage are not appropriate (TABLE II (June 1994)). Therefore, tolerances for cotton gin by products, rape forage and safflower forage must be established. The registrant must propose a tolerance for cotton gin byproducts once adequate data have been submitted and evaluated. The required data for sunflower forage will translated to rape forage and sunflower forage.

Tolerances Listed Under 40 CFR §185.5900:

The tolerances listed in 40 CFR §185.5900 are for the residues of trifluralin *per se*. Additional processing data are required for peppermint and spearmint before the established tolerances for peppermint oil and spearmint oil can be reassessed. Delaney clause issues may affect the continuation of these tolerances.

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TABLE C. TOLERANCE REASSESSMENT SUMMARY.

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances listed under 40 CFR 180.207:			
Alfalfa, hay	0.2 (N)	TBD [a]	
Asparagus	0.05	0.05	
Barley, fodder	0.05	Revoke	Fodder is no longer considered a RAC of barley.
Barley, forage	0.05	0.05	
Barley, hay	0.05	0.1	
Barley, straw	0.05	0.1	
Carrots	1.0	1.0	
Citrus fruits	0.05 (N)	0.05	*Citrus fruits group*
Corn, grain (exc. popcorn)	0.05 (N)	0.05	*Corn, field, grain*
Corn, grain (exc. popcorn), forage	0.05 (N)	0.05	*Corn, field, forage*
Corn, grain (exc. popcorn), fodder	0.05 (N)	0.05	*Corn, field, fodder*
Cottonseed	0.05 (N)	0.05	
Cucurbits	0.05 (N)	0.05	*Cucurbit vegetables group*
Flax, seed	0.05	0.05	
Flax, straw	0.05	TBD [a]	
Grain, crops (except fresh corn and rice grain)	0.05	Revoke	The tolerance should be revoked concomitant with the establishment of separate tolerances for individual members of the grain crop group.
Grapes	0.05 (N)	0.05	
Hops	0.05 (N)	0.05	
Legumes, forage	0.05 (N)	Revoke	The tolerance should be revoked concomitant with the establishment of: (i) a tolerance for *foliage of legume vegetables group*; and (ii) a separate tolerance for alfalfa forage.
Mung bean sprouts	2.0	Revoke	No registered uses exist for mung bean sprouts *per se*.
Nuts	0.05 (N)	0.05	*Tree nuts group*
Peanut, hulls	0.1	0.1	*Peanuts, hulls*
Peanuts	0.05 (N)	0.05	
Peppermint, hay	0.05 (N)	0.05	

(continued; footnotes follow.)

TABLE C *(continued).*

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Rape, seed	0.05	0.05	
Rape, straw	0.05	Revoke	Rape straw is not considered a raw agricultural commodity of rape (TABLE II (June 1994)).
Safflower seed	0.05 (N)	0.05	
Sorghum, fodder	0.05	0.05	
Sorghum, forage	0.05	0.05	
Spearmint, hay	0.05 (N)	0.05	
Stone fruits	0.05 (N)	0.05	*Stone fruits group*
Sugarcane	0.05 (N)	0.05	
Sunflower seed	0.05 (N)	0.05	
Upland Cress	0.05	Revoke	No registered uses exist.
Vegetables, fruiting	0.05 (N)	0.05	*Fruiting vegetables (except cucurbits) group*
Vegetables, leafy	0.05 (N)	Revoke	The tolerance should be revoked concomitant with the establishment of: (i) separate tolerances for celery and endive; (ii) a tolerance for *leaves of root and tuber vegetables group*; and (iii) a tolerance for *Brassica (cole) leafy vegetables group.*
Vegetables, root (exc. carrots)	0.05 (N)	Revoke	The tolerance should be revoked concomitant with the establishment of: (i) a tolerance for *root and tuber vegetables (except carrots) group*; and (ii) a tolerance for *bulb vegetables group.*
Vegetables, seed and pod	0.05 (N)	Revoke	The tolerance should be revoked concomitant with the establishment of: (i) a tolerance for *legume vegetables (dry or succulent) group*; and (ii) a separate tolerance for okra.
Wheat, grain	0.05 (N)	0.05	
Wheat, straw	0.05 (N)	0.1	

(continued; footnotes follow.)

TABLE C *(continued).*

Commodity	Current Tolerance (ppm)	Tolerance Reassessment (ppm)	Comment/*Correct Commodity Definition*
Tolerances That Need To Be Proposed under 40 CFR 180.207:			
Alfalfa, forage	None	TBD [a]	
Almonds, hulls	None	0.05	
Barley, grain	None	0.05	
Brassica (cole) leafy vegetables group	None	0.05	
Bulb vegetables group	None	0.05	
Celery	None	0.05	
Cotton, gin byproducts	None	TBD [a]	
Endive	None	0.05	
Foliage of legume vegetables group	None	0.05	
Leaves of root and tuber vegetables group	None	0.05	
Legume vegetables (dry or succulent) group	None	0.05	
Mustard seed	None	0.01	
Okra	None	0.05	
Peanuts, hay	None	0.05	
Rape forage	None	TBD [a]	
Root and tuber vegetables (exc. carrots)	None	0.05	
Safflower forage	None	TBD [a]	
Sorghum, grain	None	0.05	
Sunflower, forage	None	TBD [a]	
Wheat, forage	None	0.05	
Wheat, hay	None	0.1	
Tolerances listed under 40 CFR 185.5900:			
Peppermint oil	2.0	TBD [a]	
Spearmint oil	2.0	TBD [a]	

[a] TBD = To be determined. Reassessment of tolerance(s) cannot be made at this time because additional data are required.

CODEX HARMONIZATION

There are no Codex MRLs established or proposed for residues of trifluralin. Therefore, there are no questions with respect to compatibility of U.S. tolerances with Codex MRLs.

AGENCY MEMORANDA CITED IN THIS DOCUMENT

DEB No(s).:	5644 and 1989
DP Barcode:	None
Subject:	Trifluralin Registration Standard Followup: Response to Residue Chemistry Data Requirements.
From:	E. Haeberer, HED
To:	L. Rossi, SRRD
Dated:	10/06/89
MRID(s):	41179001 and 41179002

DEB No.:	5927
DP Barcode:	None
Subject:	Elanco Response to the Trifluralin Reregistration Standard: Animal Metabolism Studies.
From:	R. Schmitt, HED
To:	R. Engler, HED, and L. Rossi, SRRD
Dated:	11/14/89
MRID(s):	41233100, 41233101, and 41233102

DEB No.:	6432
DP Barcode:	None
Subject:	Trifluralin Registration Standard Followup: Response to Data Deficiencies in Plant Metabolism Studies for Corn and Mustard, Submission of February 22, 1990. (HED Project No. 0-0827)
From:	E. Haeberer, HED
To:	B. Baker, SRRD, and R. Engler, HED
Dated:	03/16/90
MRID(s):	41396801 and 41396802

DEB No.:	6568
DP Barcode:	None
Subject:	Trifluralin Registration Standard Followup: DowElanco Submission of Feeding Level Data for Ruminant and Poultry Metabolism Studies (HED Project No. 0-1056).
From:	E. Haeberer, HED
To:	R. Baker, SRRD, and R. Engler, HED
Dated:	04/16/90
MRID:	None

CBRS No.:	9991
DP Barcode:	D179068
Subject:	Reregistration of Trifluralin. Sorghum Grain Processing Study. Chemical No. 036101.
From:	B. Cropp-Kohlligian, CBRS, HED
To:	L. Rossi/W. Waldrop, SRRD
Dated:	09/28/92
MRID:	42325001

CBRS No.:	10143
DP Barcode:	D179897
Subject:	Reregistration of Trifluralin. Summer Squash Field Trial and Cottonseed Processing Studies. Chemical No. 036101.
From:	B. Cropp-Kohlligian, CBRS, HED
To:	L. Rossi/W. Waldrop, SRRD
Dated:	09/29/92
MRID(s):	42354501 and 42354502

CBRS No.:	10541
DP Barcode:	D182371
Subject:	Trifluralin on Green Onions, Field Corn Grain, Sugar beets (Processing) and Soybeans (Processing).
From:	D. Miller, CBRS, HED
To:	T. Stowe, SRRD
Dated:	02/01/93
MRID(s):	42448201 through 42448204

CBRS No.:	10548
DP Barcode:	D182363
Subject:	Trifluralin on Radishes, Cherries, Mustard, Wheat (Processing), Peanut (Processing), and Sunflowers (Processing).
From:	D. Miller, CBRS, HED
To:	T. Stowe, SRRD
Dated:	02/01/93
MRID(s):	42430801 through 42430806

136

CBRS No.: None
DP Barcode: None
Subject: Animal Feeding Studies: Requirement Status Modification.
From: R. Perfetti, HED
To: L. Rossi, SRRD and E. Saito, HED
Dated: 02/04/93
MRID: None

CBRS No.: 10338
DP Barcode: D181183
Subject: Reregistration of Trifluralin. Corn Grain Processing Studies. Chemical No. 036101.
From: B. Cropp-Kohlligian, CBRS, HED
To: L. Rossi/W. Waldrop, SRRD
Dated: 02/08/93
MRID: 42403201

CBRS No.: 11298
DP Barcode: D187478
Subject: Reregistration of Trifluralin. Registrant's Response to CBRS Review of Cottonseed Processing Study.
From: B. Cropp-Kohlligian, CBRS, HED
To: L. Rossi/W. Waldrop, SRRD
Dated: 03/29/93
MRID: None

CBRS No.: 11430
DP Barcode: D188347
Subject: Trifluralin Processing Study on Oranges (Whole Orange, Dried Pulp, Wet Peel, Molasses, Oil, and Juice). Case No. 179.
From: D. Miller, HED
To: T. Stowe, SRRD
Dated: 04/01/93
MRID: 42642601

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CBRS No.:	10781
DP Barcode:	D183828
Subject:	Trifluralin: DowElanco and Trifluralin Data Development Consortium Response to the Trifluralin Reg. Std. Update Dated 10/91. Residue Chemistry Requirement for Processed Potato Commodities. Chemical No. 036101.
From:	A. Aikens, CBRS, HED
To:	T. Stowe/W. Waldrop, SRRD
Dated:	06/06/93
MRID:	42514501

CBRS No.:	10673
DP Barcode:	D183215
Subject:	Trifluralin on Corn Forage, Fodder, and Silage; Alfalfa Forage, Seeds, and Peanut Vines and Hay.
From:	D. Miller, CBRS, HED
To:	T. Stowe, SRRD
Dated:	09/23/93
MRID(s):	42466001 through 42466010; 42472301, 42472302

CBRS No.:	12616
DP Barcode:	D195423
Subject:	Trifluralin Reregistration. Registrant's Response to CBRS Review of Corn Grain Processing Study. Chemical No. 036101. Reregistration Case No. 0179.
From:	B. Cropp-Kohlligian, CBRS, HED
To:	L. Rossi/W. Waldrop, SRRD
Dated:	10/28/93
MRID(s):	42917800 and 42917801

CBRS No.:	12007
DP Barcode:	D192062
Subject:	Trifluralin Reregistration. Registrant's Response to Previous Residue Chemistry Reviews of Field Corn Grain Magnitude Data and Soybean, Wheat Grain, and Peanut Processing Data.
From:	B. Cropp-Kohlligian, CBRS, HED
To:	L. Rossi/W. Waldrop, SRRD
Dated:	11/03/93
MRID(s):	42779000 and 42779001

CBRS No.:	None
DP Barcode:	D207243
Subject:	Trifluralin Reregistration. Clarification of magnitude of the residue sample storage information requirement.
From:	B. Cropp-Kohlligian, CBRS, HED
To:	W. Waldrop/C. Childress, SRRD
Dated:	9/14/94
MRID(s):	None

MASTER RECORD IDENTIFICATION NUMBERS

References (used to support established tolerances):

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APPENDIX I: SUMMARY OF STORAGE STABILITY DATA
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